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ERRATA ET ADDENDA

page 19, line 3
for 2 read t. 66

page 50, line 12
for *Linneaus* read *Linnaeus*

page 52, line 10
for makes read make

page 187, line 25
for type read TYPE

page 187, line 34
for (1835) read (1836)

page 188, line 3
for Rodriguez read Rodrigues

page 198, line 28
for **Gongora maculata** *Lindley* var. **bufonia** (*Lindl.*) *C. Schweinfurth comb. nov.* read **Gongora maculata** *Lindley* var. **leucochila** (*Lindl.*) *C. Schweinfurth comb. nov.*

In selecting a varietal epithet, the existence of a previous name in the varietal rank was overlooked.

page 215, line 7
for **Koelensteinia** read **Koellensteinia**

page 224, line 28
for *var. nov.* read *comb. nov.*

page 227, line 8
for *var. nov.* read *comb. nov.*

page 232, line 22
for *var. nov.* read *comb. nov.*

page 235, line 11
for *var. nov.* read *comb. nov.*

page 250, line 34
for roseo read rosei

page 256, line 25
for et parallela read parallela et

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NOTES ON AMERICAN ORCHIDS

BY
OAKES AMES AND DONOVAN S. CORRELL

THIS PAPER includes descriptions of several American orchid novelties and a number of miscellaneous orchid notes, among them some nomenclatorial changes which were found to be necessary.

Spiranthes Romanzoffiana *Chamisso* var. **porrifolia** (*Lindl.*) *Ames & Correll comb. nov.*

Spiranthes porrifolia Lindley Gen. & Sp. Orch. Pl. (1840) 467.

Gyrostachys porrifolia O. Kuntze Rev. Gen. Pl. (1891) 664.

Orchiastrum porrifolium Greene Man. Bot. Reg. San Francisco Bay (1894) 306.

Ibidium porrifolium Rydberg in Bull. Torr. Bot. Club 32 (1905) 610.

Specimens which conform to Lindley's type of *S. porrifolia* are readily distinguishable from the average specimen of *S. Romanzoffiana*. Usually *S. Romanzoffiana* is comparatively slender, with an elongated lax inflorescence, and is quite different in habit from the Unalaskan type. It differs also from the Irish form and from the more northern forms of North America which are characteristically stunted and usually possess a short compact inflorescence.

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The characters commonly used in separating *S. porrifolia* from *S. Romanzoffiana* may be summed up as follows: 1) *S. porrifolia*, calli of the lip rather prominent; lip essentially ovate-lanceolate in outline, usually oblong-quadrate below the constriction, scarcely (if at all) dilated at the apex and usually only cellular-papillose on the apical margin. 2) *S. Romanzoffiana*, calli minute; lip panduriform, orbicular below the constriction, strongly dilated at the apex and usually lacerate on the apical margin.

Intergrading forms between these two entities may be found. Often a lip in other respects like that of typical *S. Romanzoffiana* will possess large, fleshy calli comparable to those which occur normally in *S. porrifolia*. Conversely, a lip like that of *S. porrifolia* will possess the characteristic minute or almost obsolescent calli which characterize *S. Romanzoffiana*. The inflorescence of typical *S. porrifolia* is composed of several ranks of flowers and is characteristically more slender than that of *S. Romanzoffiana*. Several collections of *S. porrifolia* have been seen whose flowers are disposed in a single, secund or spiral rank. However, this occurrence is rare.

We consider the localized *S. porrifolia* to be a geographic variety of the widespread and fairly common *S. Romanzoffiana*, and it will be so treated in our work on the Orchidaceae of North America, north of Mexico. Variety *porrifolia* is at present known to occur in California, where it is rather abundant, and in Utah, Nevada, Washington and Oregon, where it is less common.

Epidendrum Howardii *Ames & Correll sp. nov.*

Herba elata. Pseudobulbus ovoideus, ad apicem bifoliatum sensim angustatus, vaginis magnis scariosis suffultus. Folia suberecta, lineari-ligulata, ad apicem obtusum leviter angustata, coriacea. Pedunculus terminalis, ro-

bustus, pendulus, bracteis brevibus triangularibus scariosis arcte adpressis in nodis ornatus. Inflorescentia rare paniculata, laxiflora. Ramorum et florum bracteae similes, minutae, triangulares, acutae, cucullatae. Flores spectabiles, ovario pedicellato gracili. Sepala petalaque patentia, pallidifusca et atrofusca maculata. Sepala oblanceolata, apice obtuso vel subacuto leviter recurva; sepala lateralia leviter obliqua. Petala spathulata, apice rotundato apiculata. Labellum columnae basi adnatum, purpureum, profunde trilobatum cum lobis subaequalibus; lobi laterales in positu naturali erecti et supra patentes, extensi oblique obovati, apice late rotundati, margin bus leviter undulatis; lobus medius suborbicularis, apiculatus, marginibus valde undulato-plicatis, isthmo brevi lato basi donatus; discus callo elliptico sulcato super isthmum in nervos tres incrassatos fere usque ad apicem extenso ornatus. Columna crassa, auricula parva triangulari acuta utrinque praedita.

Plant large, up to 2 m. or more tall. Pseudobulb ovoid, tapering to the bifoliate apex, about 7 cm. long and 2 cm. in diameter near the base, subtended by large scarious-fibrous sheaths. Leaves two, at the apex of the pseudobulb, suberect, linear-ligulate, somewhat tapering to the obtuse apex, coriaceous, about 40 cm. long and 2.5 cm. wide below the middle. Peduncle at the apex of the pseudobulb, stout, pendent, somewhat purple-tinged, provided at the nodes with short triangular closely adpressed scarious bracts, 7 dm. or more tall. Inflorescence a sparsely branched panicle, laxly flowered. Floral bracts and bracts subtending the flowering branches similar, minute, triangular-cucullate, acute, up to 5 mm. long. Flowers showy, with slender pedicellate ovaries which are 2–2.5 cm. long. Sepals and petals spreading, light brown, mottled with chocolate-brown. Sepals oblanceolate, slightly recurved at the obtuse to subacute apex,

EXPLANATION OF THE ILLUSTRATION

PLATE I. EPIDENDRUM HOWARDII *Ames & Correll.* 1, plant, one half natural size. 2, flower, front view, natural size. 3, flower, side view, natural size. 4, lip, spread out, twice natural size. 5, column, side view, twice natural size.

PLATE I

2–2.3 cm. long, 5.5–7 mm. wide near the apex; lateral sepals slightly oblique. Petals spatulate, rounded and apiculate at the apex, with the margins crisped, 1.8–2.2 cm. long, 5.5–6.5 mm. wide near the apex. Lip adnate to base of column, magenta, deeply 3-lobed with the lobes subequal, 1.5–1.8 cm. long and about 2 cm. wide across the lateral lobes when spread out; lateral lobes upturned in natural position, spreading above, obliquely obovate, broadly rounded at the apex, with the margins somewhat undulate, about 1 cm. long and 8 mm. wide above the middle; mid-lobe separated from the lateral lobes by a short fleshy isthmus, suborbicular, apiculate at the apex, with the margins strongly undulate-plicate, about 3 mm. long and 9 mm. wide; disc adorned with an elliptic sulcate callus on the isthmus; callus divided and extended nearly to the apex of the mid-lobe as three thickened nerves. Column rather stout, about 8 mm. long, provided with a small triangular acute auricle on each side at the apex.

This species is related to the *E. oncidioides* Lindl. complex. However, the large lateral lobes of the lip, which are equal to the mid-lobe in size, distinguish it from *E. oncidioides* and its varieties.

We take pleasure in naming this species in honor of its discoverer, Richard A. Howard.

Cuba: Oriente Prov., Sierra de Moa, dense tropical forest, 20 km. west of sawmill at Co. de Moa, July 26, 1941, *R. A. Howard 5939* (Type in Herb. Ames No. 61710; Isotype in Herb. Gray).

Epidendrum verrucosum *Swartz* in Nov. Act. Ups. 6 (1799) 68.

Epidendrum myrianthum Lindl. [var.] *album* "Rchb. f." ex Williams Orch. Grow. Man. ed. 7 (1894) 387.

In making the combination, *E. verrucosum* var. *myrianthum* (Lindl.) Ames & Correll in Bot. Mus. Leafl.

Harv. Univ. 10 (1942) 82, we inadvertently included in synonymy *E. myrianthum* Lindl. [var.] *album* "Rehb. f." ex Williams. This variety is better referable to the typically white-flowered *E. verrucosum*. The flowers of var. *myrianthum*, instead of being "almost pure white to deep ruby-red or purplish red," are apparently only ruby-red or purplish red.

Hexalectris Warnockii *Ames & Correll sp. nov.*

Herba saprophytica, erecta vel adscendens. Caules graciles, simplices vel raro ramosi, aphylli, bracteati. Inflorescentia racemosa, pauciflora. Florum bracteae ovatae vel ellipticae, acutae, concavae. Sepala lineari-elliptica vel lineari-oblanceolata, obtusa vel subacuminata; sepalum dorsale canaliculatum; sepala lateralia plusminusve falcata. Petala oblanceolata vel lineari-spathulata, obtusa vel subacuta, falcata. Labellum in circuitu suborbiculare vel late cuneato-obovatum, supra medium leviter vel conspicue trilobatum, basi rotundatum vel late cuneatum; lobi laterales obtusi vel late rotundati, in positu naturali incurvi; lobus medius valde irregularis, late obcordatus vel subquadratus, aliquid emarginatus, marginibus crenulato-dentatis; lamina prominenter nervosa, cum lamellis tribus medianis magnis undulatis prominentibus quae ex infra labelli medium usque ad prope lobi medii apicem extendunt, et lamella breviore utrinque prope lobi medii basim terminanti. Columna generis.

Plant saprophytic, erect or ascending from a slender rhizome, 1.5–3 dm. tall. Stems slender, simple or occasionally branched, aphyllous, provided with several short tubular sheaths, apparently purplish in color. Inflorescence a laxly six- to eight-flowered raceme, up to 12 cm. long. Floral bracts ovate to elliptic, acute, concave, 5–9 mm. long. Flowers with slender pedicellate ovaries which are about 7 mm. long. Sepals and petals only slightly

spreading, apparently reddish brown. Sepals linear-elliptic to linear-oblanceolate, obtuse to subacuminate, 1.5–1.8 cm. long, 3.8–4.5 mm. wide at the widest point; dorsal sepal canaliculate; lateral sepals more or less falcate. Petals oblanceolate to linear-spatulate, obtuse to subacute, falcate, 1.6–2 cm. long, 2.8–3.8 mm. wide above the middle. Lip suborbicular to broadly cuneate-obovate in outline, prominently or shallowly 3-lobed above the middle, rounded to broadly cuneate at the base, 1.5–1.8 cm. long, 1.5–1.6 cm. wide across the lateral lobes when spread out; lateral lobes obtuse to broadly rounded, upcurved in natural position, with the free part up to 4.5 mm. long; mid-lobe very variable, broadly obcordate to subquadrate, somewhat emarginate, with the margins crenulate-dentate, 4–6 mm. long, 6–11 mm. wide; lamina prominently nervose, adorned with five parallel lamellae; the three central lamellae prominent, irregularly scalloped and broken on the mid-lobe, extending from below the middle of the lip nearly to the apex of the mid-lobe, and on each side of these a shorter lamella which terminates near the base of the mid-lobe. Column somewhat clavate, arcuate, compressed, about 1 cm. long.

This species is distinguished by its narrow sepals and petals, the distinctive shape of the lip, and the peculiar scalloped and undulated lamellae which adorn the disc of the lip. The lip is very much like that of some species of *Bletia*.

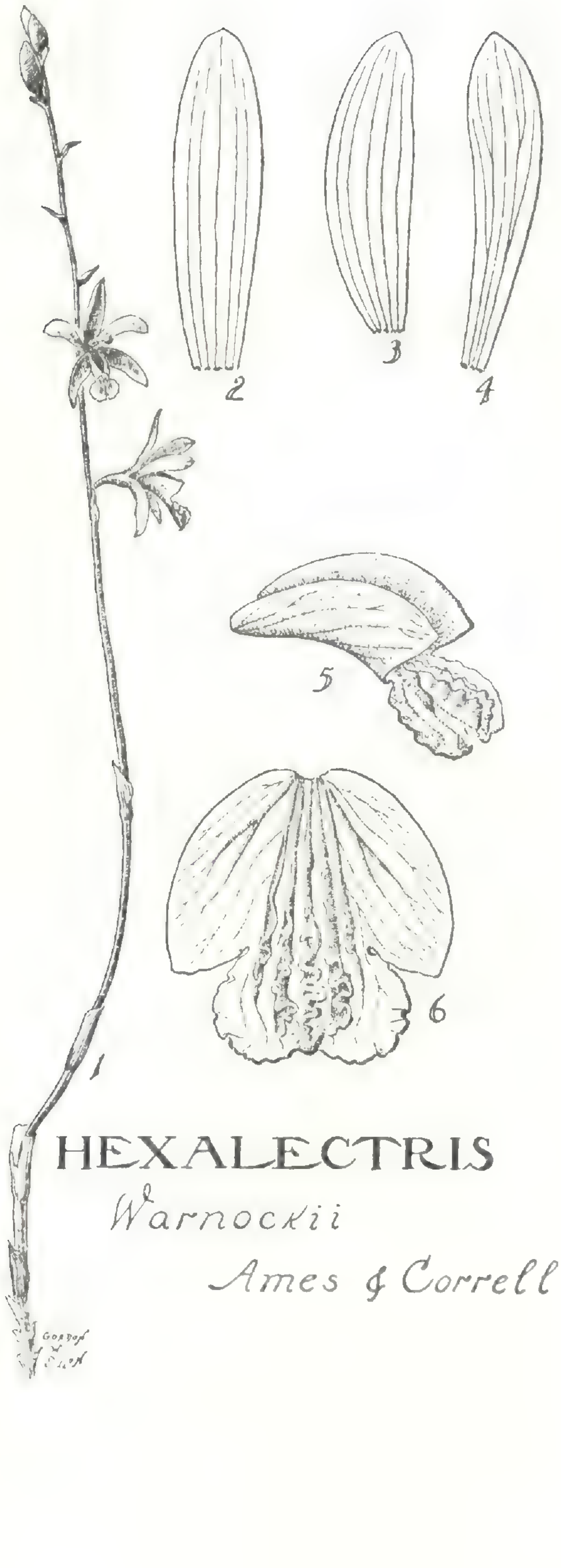
This species is named in honor of Barton H. Warnock, who for many years has been a diligent collector of botanical specimens in the Glass and Chisos Mountains of Texas.

Texas: Brewster Co., rare in upper Blue Creek Canyon, Chisos Mts., June 25, 1937, *B. H. Warnock* (Type in Herb. Univ. of Texas); Brewster Co., Chisos Mts., July 25, 1932, *C. H. Mueller 8957* (Herb. Univ. of Texas); Brewster Co., rare, Upper Juniper Spring and Blue

EXPLANATION OF THE ILLUSTRATION

PLATE II. HEXALECTRIS WARNOCKII *Ames & Correll.* 1, plant, one half natural size. 2, dorsal sepal, twice natural size. 3, lateral sepal, twice natural size. 4, petal, twice natural size. 5, lip, side view, twice natural size. 6, lip, spread out, twice natural size.

Plate II



HEXALECTRIS

Warnockii

Ames & Correll

Creek, Chisos Mts., June 25, 1937, *B. H. Warnock 658* (Herb. Sul Ross State Teachers College; U. S. Nat. Herb.); Brewster Co., under *Quercus*, Oak Canyon, alt. 1370 m., July 5, 1931, *J.A.Moore & J.A. Steyermark 3391* (Herb. Mo. Bot. Gard.); Brewster Co., Fern Canyon, Alpine, July 7, 1925, *Mr. & Mrs. W. W. Wimberley* (Herb. Cornell Univ.); Jeff Davis Co., Fern Canyon, July 24, 1938, *O. E. Sperry T507* (Herb. Sul Ross State Teachers College).

It is interesting to note that the genus *Hexalectris* has had a remarkable increase in number of species during the last two years. Prior to October, 1940, only two species were known, *H. spicata* (Walt.) Bernh. and *H. mexicana* Greenm. In June, 1941 (Correll in Bot. Mus. Leafl. Harv. Univ. 10, p. 20), a key was published for the identification of the five species then known.

Xylobium concavum (*Lindl.*) *Hemsley* in Godman and Salvin Biol. Centr.-Am. Bot. 3 (1883) 252.

Maxillaria concava Lindley in Bot. Reg. 30 (1844) Misc. p. 4.

Maxillaria stachyobiorum Reichenbach filius in Bot. Zeit. 10 (1852) 735.

Xylobium stachyobiorum Hemsley in Godman and Salvin Biol. Centr.-Am. Bot. 3 (1883) 252.

In describing *Maxillaria concava*, Lindley wrote: "At first sight this species might be mistaken for *M. bractescens*; . . . ."

Later, Reichenbach wrote concerning his *Maxillaria stachyobiorum:* "Die Art selbst nächst *M. bractescens* Lindl."

A comparison of an analytical drawing in the Ames Herbarium of a specimen of *M. stachyobiorum* in the Reichenbach Herbarium with a drawing of the lip of *M. concava* taken from a specimen in the Lindley Herbarium shows that they are essentially the same. The lip of *M. stachyobiorum* is shown as somewhat narrower than that

of *M. concava*. However, the lobing and callus is similar in both concepts. Specimens examined have the setaceous floral bracts attributed to *M. concava*.

This species has been found in Mexico, Guatemala, Costa Rica and Panama where it is epiphytic on trees in forests from sea level up to 1200 meters altitude.

Xylobium Powellii *Schlechter* in Fedde Repert. Beihefte 17 (1922) 66.

Xylobium sublobatum Schlechter in Fedde Repert. Beihefte 19 (1923) 51.

A comparison of an analytical drawing in the Ames Herbarium of the type of *X. sublobatum* in the Schlechter Herbarium with an isotype of *X. Powellii* reveals that they are conspecific. The lateral lobes of the lip of *X. Powellii* are more pronounced than in *X. sublobatum*. Otherwise, the two concepts are identical. The trilamellate disc of the lip is evident in both, and both have the characteristically short pseudobulb and inflorescence.

This species is extremely close to *X. Tuerckheimii* Kränzl. If it were possible to examine the type of that concept, we believe it would prove to be conspecific with *X. Powellii*.

Xylobium Powellii has been found in Costa Rica and Panama where it grows on trees and stumps in forests up to 2000 meters altitude.

Since *Maxillaria*, *Camaridium* and *Ornithidium* are now considered to be congeneric, the following nomenclatorial changes for several Central American species are necessitated.

Maxillaria bracteata (*Schltr.*) *Ames & Correll comb. nov.*

Ornithidium bracteatum Schlechter in Fedde Repert. 9 (1911) 217.

Camaridium bracteatum Schlechter in Fedde Repert. Beihefte 19 (1923) 57.

This species has been found only in Costa Rica where it occurs on trees in forests up to 1900 meters altitude.

Maxillaria brevilabia *Ames & Correll nom. nov.*

Ornithidium Alfaroi Ames & Schweinfurth in Sched. Orch. 10 (1930) 98, non *Maxillaria Alfaroi* Ames & Schweinfurth.

This species has been found only in Costa Rica where it grows on trees in forests up to 1800 meters altitude.

The specific name is in allusion to the relatively short lip.

Maxillaria concavilabia *Ames & Correll nom. nov.*

Ornithidium stenophyllum Schlechter in Fedde Repert. Beihefte 19 (1923) 59, nec *Maxillaria stenophylla* Reichenbach filius, nec *Maxillaria stenophylla* Lehman & Kränzlin.

This species has been found only in Costa Rica.

The specific name is in allusion to the prominently concave lip.

Maxillaria falcata *Ames & Correll nom. nov.*

Ornithidium costaricense Schlechter in Fedde Repert. 8 (1910) 456, non *Maxillaria costaricensis* Schlechter.

This species is common in Costa Rica, the only country in which it has been found. It occurs as an epiphyte on trees in forests up to 2500 meters altitude.

The specific name is in allusion to the falcate lateral lobes of the lip.

Maxillaria paleata (*Reichb.f.*) *Ames & Correll comb. nov.*

Ornithidium paleatum Reichenbach filius in Linnaea 41 (1876) 36.

This species has been found in Nicaragua and Costa Rica where it grows on trees in open forests and pastures up to 1050 meters altitude.

Maxillaria quadrata *Ames & Correll nom. nov.*

Ornithidium Lankesteri Ames in Sched. Orch. 4 (1923) 52, non *Maxillaria Lankesteri* Ames.

This species has been found only in Costa Rica where it is epiphytic on trees in pastures and on ridges of upper slopes up to 1900 meters altitude.

The specific name is in allusion to the typically quadrate lateral lobes of the lip. The inflorescence is a showy mass of pinkish white flowers.

Maxillaria serrulata *Ames & Correll nom. nov.*

Camaridium Amparoanum Schlechter in Fedde Repert. Beihefte 19 (1923) 56, non *Maxillaria Amparoana* Schlechter.

This species has been found only in Costa Rica where it is epiphytic on trees.

The specific name is in allusion to the serrulate-denticulate mid-lobe of the lip.

Maxillaria sigmoidea (*C. Schweinf.*) *Ames & Correll comb. nov.*

Ornithidium sigmoideum C. Schweinfurth in Bot. Mus. Leafl. Harv. Univ. 4 (1937) 121.

This species has been found only in Costa Rica where it is epiphytic on trees in forests up to 2000 meters altitude.

Maxillaria purpurea (*Sprengl.*) *Ames & Correll comb. nov.*

Epidendrum vestitum Swartz Prodr. Veg. Ind. Occ. (1788) 124, non *Maxillaria vestita* Schlechter.

Cymbidium vestitum Swartz in Nov. Act. Ups. 6 (1799) 70.
Camaridium purpureum Sprengel Syst. Veg. 3 (1826) 735.
Ornithidium vestitum Reichenbach filius in Walp. Ann. Bot. 6 (1863) 491.
Ornithidium simulans Ames & Schweinfurth in Sched. Orch. 10 (1930) 99.

Ornithidium simulans and *O. vestitum* in the past were thought to be separable—*O. simulans* confined to Central America; *O. vestitum* widespread in the West Indies and northern South America. However, a comparison of these two concepts shows that they are identical.

This species has been found in Guatemala, Honduras, throughout the West Indies and northern South America where it is epiphytic on trees and on rocks in forests at low elevations.

Maxillaria strumata (*Endres & Reichb.f.*) *Ames & Correll comb. nov.*

Ornithidium strumatum Endres & Reichenbach filius in Gard. Chron. n.s. 2 (1874) 772.
This species has been found only in Costa Rica.

Maxillaria trilobata *Ames & Correll nom. nov.*
Camaridium Brenesii Schlechter in Fedde Repert. Beihefte 19 (1923) 237, non *Maxillaria Brenesii* Schlechter.
This species has been found only in Costa Rica where it grows on trees in cloud forests up to 1500 meters altitude.

The specific name is in allusion to the prominently 3-lobed lip.

Maxillaria Tonduzii (*Schltr.*) *Ames & Correll comb. nov.*

Camaridium costaricense Schlechter in Fedde Repert.

3 (1907) 250, non *Maxillaria costaricensis* Schlechter. *Camaridium Tonduzii* Schlechter in Fedde Repert. 8 (1910) 571.

This species has been found only in Costa Rica where it occurs as an epiphyte on trees up to 1600 meters altitude.

Maxillaria Wrightii (*Schltr.*) *Ames & Correll comb. nov.*

Camaridium Wrightii Schlechter in Fedde Repert. 16 (1920) 448.

Ornithidium Wrightii C. Schweinfurth in Bot. Mus. Leafl. Harv. Univ. 4 (1937) 95.

This species has been found in Nicaragua and Costa Rica.

Maxillaria Wrightii (*Schltr.*) *Ames & Correll* var. **imbricata** (*Schltr.*) *Ames & Correll comb. nov.*

Camaridium imbricatum Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 415, non *Maxillaria imbricata* Rodriguez.

Ornithidium Schlechterianum C. Schweinfurth in Bot. Mus. Leafl. Harv. Univ. 4 (1937) 94.

Vegetatively, var. *imbricata* is extremely close to the typical form of the species. However, the flowers are only one half to two thirds as large as those of typical *M. Wrightii*.

Variety *imbricata* has been found only in Costa Rica where it grows on trees and in soil on banks up to 2400 meters altitude.

Maxillaria Adolphii (*Schltr.*) *Ames & Correll comb. nov.*

Ornithidium Tonduzii Schlechter in Fedde Repert. 3 (1907) 250, non *Maxillaria Tonduzii* (Schltr.) Ames & Correll.

Camaridium Adolphi Schlechter in Fedde Repert. Beihefte 19 (1923) 58; Fedde Repert. Beihefte 59 (1931) 2, Nr. 263.

This species has been found only in Costa Rica where it grows on trees in forests up to 2600 meters altitude.

Odontoglossum convallarioides (*Schltr.*) *Ames & Correll comb. nov.*

Osmoglossum convallarioides Schlechter in Fedde Repert. Beihefte 19 (1923) 148.

This species forms with *Odontoglossum Egertonii* Lindl. and *O. pulchellum* Batem. ex Lindl. a complex group of plants. All three species are similar in habit. However, there are floral differences which readily keep them apart. This species differs from *O. Egertonii* in that the broader lateral sepals are almost free instead of being united almost to the apex as in that species, and the lip is distinctly constricted below the middle, a character lacking in *O. Egertonii*. The column of *O. convallarioides* is almost without apical lobules, whereas the column of *O. Egertonii* is deeply 3-lobed with the lobes fringed. *Odontoglossum convallarioides* differs from *O. pulchellum* not only in the smaller flowers but also in the column which is not conspicuously lobulate and in the lip which is flat and concave instead of being strongly arcuate-deflexed as in that species.

This species is rare in Mexico and Guatemala, but common in Costa Rica, where it occurs as an epiphyte on trees in forests usually at high elevations up to 2700 meters altitude.

Oncidium guatemalense *Schlechter* in Fedde Repert. 10 (1912) 362.

Odontoglossum oliganthum Reichenbach filius in Bonpl. 4 (1856) 321.

Oncidium guatemalense and *Odontoglossum oliganthum* have in the past been considered as distinct. However, we now consider them to be identical and referable to *Oncidium guatemalense*.

This species is rare in Mexico and Guatemala where it occurs as an epiphyte on trees in forests up to 2000 meters altitude.

Oncidium Wentworthianum *Bateman ex Lindley* var. **tenue** (*Lindl.*) *Ames & Correll comb. nov.*

Oncidium tenue Lindley in Journ. Hort. Soc. 3 (1848) 76, fig.

Variety *tenue* differs from the typical form of the species mainly in the usually smaller and differently colored flowers. The strongly undulate sepals and petals have an acute-apiculate apex and are commonly shorter and narrower than in typical *O. Wentworthianum*. They are solidly reddish brown with the apical fourth yellow, whereas the sepals and petals of the typical form are lemon-yellow with dark brown irregular blotches or stains on the lower half. The lip of var. *tenue* is adorned with a wide solid wine-colored band across the broad isthmus. The callus of the lip and the column-wings are essentially alike in the two concepts. The inflorescence of var. *tenue* is occasionally as much as three meters in length and the branches are usually short and few-flowered. The floral measurements are as follows: Sepals 1.1–1.5 cm. long, 3.5–6 mm. wide; petals 1–1.3 cm. long, 4–6 mm. wide; lip 1.3–1.8 cm. long, 1.1–1.4 cm. wide across the auriculiform lateral lobes, 9–11 mm. wide across the bilobulate mid-lobe.

There is little doubt that this variety has been confused with *O. ansiferum* Reichb. f. and other species in the *O. reflexum* Lindl. complex. It is easily distinguished from *O. ansiferum* by the differently shaped callus of the lip

and the column-wings. An examination of Lindley's illustration of *O. tenue* shows the short-branched inflorescence which is characteristic of this variety.

Variety *tenue* is rare in Mexico and Guatemala where it is epiphytic on trees in humid forests up to about 1000 meters altitude.

Leochilus Johnstonii *Ames & Correll sp. nov.*

Herba parva, glabra, saepissime caespitosa. Pseudobulbi inconspicui, suborbiculares, apice unifoliati, basi vaginis distichis foliiferis celantibus ornati. Folia linearia-ligulata, obtusa, articulata, coriacea; vaginae valde conduplicatae, crassae, marginibus hyalinis. Inflorescentia in pseudobulbi basi axillaris, quam folia multo brevior, erecto-adscendens vel patens et pendula, pluriflora; pedunculus et rachis angulata. Florum bracteae triangulari-ovatae vel triangulari-lanceolatae, acutae, concavae, scariosae. Flores parvi, cum ovariis pedicellatis crassis sigmoideo-arcuatis, trialatis. Sepala libera, elliptica vel elliptico-lanceolata, acuta, dorso carinata, navicularia; sepalum dorsale erecto-arcuatum, cucullum super columnam formans; sepala lateralia obliqua, patentia. Petala elliptica vel oblongo-elliptica, obtusa vel subacuta, leviter concava, plusminusve porrecta. Labellum patens, ellipticum, leviter retusum, marginibus paulo recurvis minute undulatis, conspicue trinervium nervis ramosis; discus ima basi callo profunde concavo glabro, et antice callo subquadrato leviter sulcato puberulo ornatus. Columna carnosa, clavata, medio stelidio parvo oblique triangulari obtuso porrecto utrinque donata. Capsula obovoideo-ellipsoidea vel late ellipsoidea, tenuiter pedicellata, erostrata, tr quetra angulis valde alatis.

Plant small, glabrous, usually growing in clumps, up to 11 cm. tall. Pseudobulbs inconspicuous, suborbicular, less than 6 mm. long, about 3 mm. wide, unifoliate,

EXPLANATION OF THE ILLUSTRATION

PLATE III. LEOCHILUS JOHNSTONII *Ames & Correll.* 1, plant, one and one fifth times natural size. 2, flower, front view, spread open, three times natural size. 3, flower, front-side view, partly spread open, three times natural size.

PLATE III

LEOCHILUS

Johnstonii *Ames & Correll*

completely concealed by leaf-sheaths. Leaf solitary at apex of pseudobulb, also several distichously arranged at base of pseudobulb, linear-ligulate, obtuse, coriaceous, articulate, 2.5–6.5 cm. long, 5–10 mm. wide; sheaths thick, strongly conduplicate, with hyaline margins, 8–15 mm. long. Inflorescence from axil of leaf at base of pseudobulb, much shorter than the leaves, erect-ascending or spreading-pendent, several-flowered, up to 4 cm. long; peduncle and rachis angular. Floral bracts triangular-ovate to triangular-lanceolate, acute, concave, scarious, 3–5 mm. long. Flowers small, with stout sigmoid-arcuate 3-winged pedicellate ovaries which are about 8 mm. long, with the wings of the ovary continuous into the sepals. Sepals free, elliptic to elliptic-lanceolate, acute, dorsally carinate, longitudinally concave, 6.5–7 mm. long, 2–2.3 mm. wide; dorsal sepal erect-arcuate to form a hood over the column; lateral sepals spreading, oblique. Petals elliptic to oblong-elliptic, obtuse to subacute, slightly concave, somewhat directed forward, 5.5–6 mm. long, 2.2–2.8 mm. wide. Lip spreading, elliptic, lightly retuse at the apex, with the slightly recurved margins minutely undulate, prominently 3-nerved with the nerves branched, about 6 mm. long and 3.5 mm. wide at the middle; disc provided at the extreme base with a deeply concave glabrous callus with very fleshy margins which are open in front, with a subquadrate slightly sulcate puberulent callus in front of the concave base, the entire callus about 3 mm. long and 1 mm. wide. Column fleshy, clavate, about 3 mm. long, provided on each side about the middle with a small obliquely triangular obtuse arm which projects forward. Capsule on a slender pedicel, obovoid-ellipsoid to broadly ellipsoid, beakless, triangular in cross-section with the three angles prominently winged, about 1.5 cm. long.

Superficially, *L. Johnstonii* is most closely allied to *L.*

trieuspidatus (Reichb.f.) Kränzl., of Costa Rica. However, it differs from that species in the short inflorescences which are always exceeded by the leaves; the elliptic (instead of obovate) lip which is not strongly deflexed at the base and which is only slightly retuse instead of being bilobulate at the apex; and in the shape of the callus at the extreme base of the lip. The two species are similar in their capsules which are beakless and strongly 3-winged. The flowers, except for being smaller, are almost identical in appearance with those of *L. oncidioides* Knowles & Weste. However, the lateral sepals are entirely free at the base, whereas those of *L. oncidioides* are united for about one third their length. Vegetatively, these two species are very different. The inconspicuous pseudobulbs, short and stubby inflorescences, and beakless strongly 3-winged capsule of *L. Johnstonii* immediately separate it from *L. oncidioides*.

It is of interest to note that the descriptions we have seen of the genus *Leochilus* fail to describe adequately the fruits of the various species included in that genus. The capsules are usually briefly described as "ellipsoidal, beaked." They are actually rotund-trigonous to ellipsoid, strongly beaked or beakless, and with or without prominent wings.

We take pleasure in naming this species in honor of its discoverer, John R. Johnston.

GUATEMALA: Alta Verapaz, Tactic, *J. R. Johnston 1864* (TYPE in Herb. Ames No. 61709); mountains east of Tactic, on road to Tamahú, dense wet forest, on tree, 1500-1650 meters altitude, *P. C. Standley 71432* (Herb. Field Mus.).

Leochilus labiatus (*Sw.*) *O. Kuntze* Rev. Gen. Pl. (1891) 656 (as *Leiochilus*)—Cogniaux in Urban Symb. Antill. 4 (1903) 182.

Epidendrum labiatum Swartz Prodr. Veg. Ind. Occ. (1788) 124; Fl. Ind. Occ. (1799) 1493.

Liparis labiata Sprengel Syst. Veg. 3 (1826) 741.
Rodriguesia cochlearis Lindley in Ann. & Mag. Nat. Hist. 5 (1840) 116.
Leochilus cochlearis Lindley in Bot. Reg. 28 (1842) Misc. p. 23.
Oncidium labiatum Reichenbach filius in Walp. Ann. 6 (1863) 741.
Leiochilus gracilis Schlechter in Fedde Repert. Beihefte 19 (1923) 152.

A comparison of *Leochilus labiatus* and *L. gracilis* reveals that they are identical. Heretofore, *L. labiatus* has been considered as occurring only in the West Indies, whereas *L. gracilis* was thought to be restricted to Central America.

This species is found in Guatemala, Honduras, Costa Rica, Panama, Cuba, Hispaniola, Puerto Rico, Guadeloupe, Dominica, St. Vincent and Trinidad. It is epiphytic on trees in dense or open forests up to 1200 meters altitude.

Leochilus scriptus *Reichenbach filius* Xen. Orch. 1 (1854) 15, t. 6.

Cryptosanus scriptus Scheidweiler in Otto & Dietrich Allg. Gartenz. 11 (1843) 101.

Oncidium scriptum Reichenbach filius in Walp. Ann. Bot. 6 (1863) 772.

There is a sterile specimen from Cuba in the Ames Herbarium (*Bohnhoff*) which is undoubtedly this species. Vegetatively, it is an exact match for typical material from Central America. It is noted here as from Cuba in order that it may be brought to the attention of botanical collectors. The area of distribution may now be defined as Guatemala, Honduras, Costa Rica, Panama and questionably Cuba. Two species of *Leochilus*, *L. labiatus*

(Sw.) O. Ktze. and *L. salvus* (Reichb.f.) Griseb., are definitely known to occur in Cuba.

Ornithocephalus inflexus *Lindley* in Ann. & Mag. Nat. Hist. ser. 1, 4 (1840) 384.

Ornithocephalus mexicanus A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 24.

Ornithocephalus elephas Reichenbach filius in Walp. Ann. Bot. 6 (1863) 493.

Ornithocephalus Pottsiae S. Watson in W.T. Brigham Guatemala the Land of the Quetzal (1887) 429, *nomen;* in Proc. Am. Acad. 22 (1887) 478.

Ornithocephalus Tonduzii Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 420.

A number of concepts, based for the most part on minor variations, have been proposed for this variable species. A comparison of an analytical drawing in the Ames Herbarium of the type of *O. Tonduzii* in the Schlechter Herbarium with a photograph (with analytical drawings) of the type of *O. inflexus* shows that these concepts are conspecific. An examination of a tracing in the Ames Herbarium of the type of *O. elephas* in the Reichenbach Herbarium reveals that it is referable to *O. inflexus*. An examination of the type of *O. Pottsiae* in the Gray Herbarium shows that it is the same as *O. inflexus*.

This species has been found in Mexico, British Honduras, Guatemala, Honduras and Costa Rica where it occurs as an epiphyte on trees in forests and pasturelands up to 1100 meters altitude.

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ECONOMIC PLANTS OF ST. JOHN, U. S. VIRGIN ISLANDS

BY
ROBERT H. WOODWORTH
(*Bennington College, Bennington, Vermont*)

THE ISLAND OF ST. JOHN presents a truly virgin appearance, being forested from the hilltops to the water's edge. A century ago practically the whole island was under cultivation, sugar cane being the main crop. After 1848, when slavery was abolished, the cultivation of the island's very poor soil was no longer profitable. As the forests slowly covered the hillsides the population gradually dropped from twenty-five hundred to less than one-third that number.

Among the few remaining signs of this earlier activity are the ruins of the sugar estates, and even these are, for the most part, overgrown with vines and trees.

Most sections of the island are accessible by trails which wind over the mountains, along the shores and through the dense vegetation of the deep valleys. There are no roads. The island is free from the "improvements of modern civilization" and interestingly enough has no urgent economic problems. It is not intended to imply that the natives would not profit by a better diet, but this is just as true of people everywhere. A large majority of the St. John folk have never been off their island. The natives have less than the people of nearby islands and

live more simply; possibly because they are isolated from the common causes of discontent they are happier and more independent. Their diet consists of corn meal, fish (the nearby waters comprise some of the finest fishing grounds), meat from a few domestic animals, produce from small gardens, and certain wild plants.

FOOD PLANTS

Panicum maximum *Jacquin.* Gramineae.

GUINEA GRASS.

This tall African grass is grown for forage. It is one of the favorite foods of horses and cattle.

Smilax coriacea *Sprengel.* Liliaceae.

BELL APPLE.

Children eat the yellow fruit. (See also medicinal plants).

Cocos nucifera *Linnaeus.* Palmae.

WATERNUT.

The liquid endosperm (i.e. water) of the green unripe fruit is drunk and the gelatinous endosperm is eaten. This is an important part of the diet. The hard white endosperm of the ripe coconut is considered unfit for human consumption but is fed to hogs.

Piper Amalago *Linnaeus.* Piperaceae.

BLACK WATTLE, CRAB WOOD.

The leaves are dried and used for making tea. This species is also mentioned under medicinal plants, and plants providing wood.

Coccoloba uvifera *Linnaeus.* Polygonaceae.

SEA GRAPE.

The fruits are eaten raw or made into an excellent jam. There is not much flesh around the large seed. The heavy crop ripens progressively during several months.

Boerhaavia erecta *Linnaeus.* Nyctaginaceae.

BATA-BATA.

The succulent leaves of this spreading herb are used for spinach. They are one of the constituents of the dish called *calalon.*

Petiveria alliacea *Linnaeus.* Phytolaccaceae.

CONGA ROOT.

Although the specific name suggests the odor of this plant, the leaves are sometimes dried for tea by the natives.

Annona muricata *Linnaeus.* Annonaceae.

SOURSOP.

The fruit is used in making sherbet.

Annona glabra *Linnaeus.* Annonaceae.

BONYA, DOG APPLE.

This fruit is eaten even though it is not esteemed as highly as that of other members of the genus. (See also under wood).

Annona squamosa *Linnaeus.* Annonaceae.

SUGAR APPLE.

The fruit of this small tree is common and much appreciated.

Leucaena glauca (*L.*) *Bentham.* Leguminosae.

WILD TAMARIND.

Horses feed on the leaves of this shrub when guinea grass gets old and unpalatable. If they get little else in their diet the hair of the tail and mane falls out, possibly because of some poison or because of some dietary deficiency. When the diet changes hair grows in again. This plant also provides wood.

Cassia occidentalis *Linnaeus.* Leguminosae.

STINKING WEED.

The seeds are parched, ground and brewed for a beverage like coffee.

Inga laurina (*Sw.*) *Willdenow*. Leguminosae.

Sweet Peas.

The long horizontal lenticels and the light bark give this tree the appearance of our northern birches. Children eat the seeds.

Centrosema virginianum (*L.*) *Bentham*. Leguminosae.

Blue Wiss.

This is one of the favorite foods of horses. They will cover a great deal of territory selecting these diminutive vines while ignoring abundant stands of guinea grass. This is also a fiber plant.

Gliricidia sepium (*Jacq.*) *Steudel*. Leguminosae.

Madre de Cacao.

This tree can be used to provide a valuable cattle food. The small branches are cut into pieces containing several nodes. These are placed in rows in the ground. They grow quickly, developing an abundance of herbage which is high in protein content. The cattle are turned in to feed until the growth is stripped, then it is allowed to grow out again.

Tamarindus indica *Linnaeus*. Leguminosae.

Tamarind.

The young pods are made into jam. They are first soaked in water which is thrown away. Then they are boiled, and preserved in a syrup.

Phyllanthus acidus (*L.*) *Skeels*. (*Cicca disticha* L.). Euphorbiaceae.

Gooseberry.

The berries are made into jam or eaten fresh. (See also under wood plants).

Spondias Mombin *Linnaeus*. Anacardiaceae.

PLUM.

The fruit is fed to hogs, although in other localities it is esteemed for human consumption. (See also under wood).

Melicocca bijuga *Linnaeus*. Sapindaceae.

CANIP, KNIP, GUINIP.

This well known fruit tree of the warmer regions is common on St. John. It bears an abundance of fruit which is relished by the natives and visitors.

Corchorus siliquosus *Linnaeus*. Tiliaceae.

PAPA LOLA.

The leaves are frequently used for spinach. They are one of the ingredients of the dish called *calalou*.

Terminalia Catappa *Linnaeus*. Combretaceae.

ALMOND.

Both the fleshy outer part of the fruit and the oily seed are eaten. (See also under ornamental plants).

Psidium amplexicaule *Persoon*. Myrtaceae.

SPICE GUAVA.

When cut, the wood smells like Hubbard Squash. The fruit is eaten.

Eugenia ligustrina *Willdenow*. Myrtaceae.

CRUMBERRY.

The berries are used in making jam and in the preparation of a rum similar to guava-berry rum.

Eugenia procera *Poiret*. Myrtaceae.

GUAVA-BERRY.

This is the plant which several generations ago provided the fruits for the famous guava-berry rum of the locality. Quite recently an attempt was again made to produce this drink commercially. Several barrels of guava-berries were shipped to Denmark, but this was just previous to the German occupation and nothing has been heard of the shipment. Individuals still make guava-berry rum for their own use, particularly at the holiday season.

Cordia glabra *Linnaeus.* Boraginaceae.

MANJACK.

The fruit of this tree is fed to hogs. (See also under wood).

Tournefortia hirsutissima *Linnaeus.* Boraginaceae.

GINIPER, CHICKENET.

When the leaves are dried they make an excellent tea.

Cordia nitida *Vahl.* Boraginaceae.

BASTARD MANJACK.

The fruits are gathered and fed to hogs.

Ocimum micranthum *Willdenow.* Labiatae.

ROCK BALSAM.

The dried fragrant leaves are used for tea.

Solanum polygamum *Vahl.* Solanaceae.

PARKA, COCCULARKA.

The leaves of this shrub are interesting in that there are upright spines from the midrib. Children eat the berries.

PLANTS USED FOR FISH BAIT

Annona muricata *Linnaeus.* Annonaceae.

SOURSOP.

The fruit is an excellent bait for use in fish pots. It is also edible.

Pachycereus marginatus (*DC.*) *Britton & Rose.* Cactaceae.

DIDDLEDOO.

This is the Organ Pipe Cactus. The green rind is peeled off and the inside of the young stems is used for fish pot bait.

Morinda citrifolia *Linnaeus.* Rubiaceae.

PAINKILLER.

Pieces of the large fruit are used for bait in fish pots. This is also a medicinal plant.

POISONOUS PLANTS

Piscidia piscipula (*L.*) *Sargent.* Leguminosae.

DOGWOOD.

Leaves and twigs are broken up and scattered on the water. Fish feed on these bits and are quickly poisoned and easily caught.

Malpighia infestissima (*Juss.*) *Richard.* Malpighiaceae.

MAD DOG, TOUCH-ME-NOT.

Common on dry, exposed slopes. The leaves and young stems are covered with large needle-like hairs which penetrate the skin causing painful dermatitis.

Asclepias curassavica *Linnaeus.* Asclepiadaceae.

PETIE GUANA.

It is said that this plant will cause the death of any animal which eats it and that it is more poisonous at certain seasons than at others.

Smilax coriacea *Sprengel.* Liliaceae.

BELL APPLE.

The vegetative parts of the plant are brewed to provide an abortifacient. I am told that this would only be used when it was considered extremely dangerous for the mother to continue in pregnancy. Ordinarily pregnancy is to be encouraged since the population of St. John has been regularly declining. Possibly a deficient diet renders pregnancy difficult.

Mild doses of this tea are used to rid children of worms. (See also under food plants).

Piper Amalago *Linnaeus.* Piperaceae.

BLACK WATTLE.

The green leaves are brewed to provide a remedy for coughs. The dried leaves are used in the preparation of a beverage tea. (See also under wood).

Phthirusa caribaea (*Krug & Urban*) *Engler.* Loranthaceae.

BASS AND BOOM.

The leaves of this mistletoe are boiled for a brew which is drunk to relieve strains caused by lifting heavy loads.

Bryophyllum pinnatum (*L.*) *Kurz.* Crassulaceae.

CLAPPER BUSH, GREEN LOVE, AIR PLANT.

The leaves are steeped and the brew drunk to relieve pain in the kidneys.

Cassia occidentalis *Linnaeus.* Leguminosae.

STINKING WEED.

The root is boiled and the brew drunk for aiding appetite or for treating cramps. (See also under food).

Pithecellobium Saman (*Willd.*) *Bentham.* Leguminosae.

RAIN TREE, KINDLY TREE, FRIENDLY TREE, LICORICE, SAMAN.

The seeds are chewed for sore throat; an elixir prepared from them is also used.

Andira inermis *Humboldt, Bompland & Kunth.* Leguminosae.

PIGTURD, HUNKLUT (from an old creole name). Both of these common names refer to the appearance of the seeds on the ground.

The bark and seeds are used to prepare a purging brew which must be used with care because it is poisonous in large doses. (See also under wood).

Galactia dubia *De Candolle.* Leguminosae.

IRON WEED.

A tea from the leaves is used for relieving pain in the back caused by overexertion. It is practically impossible to pull the root system of this plant out of the ground. For this reason it is suggested that the medicinal use is in accord with the doctrine of signatures.

Jatropha gossypiifolia *Linnaeus.* Euphorbiaceae.

PHYSIC NUT.

The leaves are boiled and the brew drunk for a mild physic. The brew is also used to wash sores and ulcers.

Phyllanthus Niruri *Linnaeus.* Euphorbiaceae.

CANE PEAS SENNA.

A common weed in the West Indies and tropical America.

The whole plant is brewed and the liquor boiled down. Some of this extremely bitter liquor is drunk each morning, for several days, in cases of malaria and dengue fever.

This remedy is very highly thought of by the natives. If it is as effective as they claim, it might well serve as a substitute for quinine.

The fifth edition of Merck's Index refers to an extract ($C_{30}H_{37}O_8$) from the leaves of this plant which is said to poison fish. It does not have characters of a glucoside. This may or may not be the effective principle.

Canella Winterana (*L.*) *Gaertner*. Canellaceae.

PEPPER CINNAMON.

The thick leaves, which contain many oil glands, are boiled and the liquor is used as a drink and to bathe the whole body in cases of grippe or "cold all over the body." This treatment makes the individual sweat profusely.

Xanthoxylum flavum *Vahl*. Rutaceae.

YELLOW SANDALWOOD.

An extract from the bark of the trunk and roots has been used as a tonic. (See also under wood).

Melochia nodiflora *Swartz*. Bombacaceae.

BLACK MARSHMALLOW.

This very common plant is pounded, mixed with salt and vinegar and put on cuts and sprains.

Rauwolfia Lamarckii *A. De Candolle*. Apocynaceae.

BITTER BUSH, BELLYACHE.

The leaves are boiled and the brew drunk to aid in elimination of the afterbirth following parturition.

Cuscuta americana *Linnaeus*. Convolvulaceae.

YELLOW LOVE.

This plant, together with the leaves of yellow cedar (see below), is brewed for a "fever tea" which is much used.

Heliotropium angiospermum *Murray.* Boraginaceae.

EYEBRIGHT.

The plant is boiled and the brew used to bathe irritated eyes.

Scoparia dulcis *Linnaeus.* Scrophulariaceae.

TEETH BUSH.

The whole top of the plant is boiled and the brew applied to gums when children are cutting teeth.

Tecoma stans (*L.*) *Humboldt, Bompland & Kunth.* Bignoniaceae.

YELLOW CEDAR, GINGER THOMAS.

The leaves, together with the dodder (*Cuscuta americana* L.) mentioned above, are brewed for a "fever tea."

Crescentia Cujete *Linnaeus.* Bignoniaceae.

CALABASH, GOURD TREE.

The fruit-pulp is boiled and the thick liquor taken for respiratory troubles. (See also under miscellaneous economic plants).

Bontia daphnoides *Linnaeus.* Myoporaceae.

BUTTONWOOD.

The leaves are steeped and the brew administered to people who are suffering from fish poisoning. The whole problem of poisoning from fish is a serious one for these folk: whether it is caused by fish which have been dead too long for safe consumption (no ice is available) or by fish which are poisonous even if eaten immediately after being caught. It is reported that there are as many as forty deaths a year due to fish poisoning on the nearby island of Tortola alone.

Morinda citrifolia *Linnaeus.* Rubiaceae.

PAINKILLER.

The leaves of this common shrub are brewed to provide a liquor which is applied externally to relieve pain. Also pieces of the large fruit are heated and put on sores or inflamed regions. (See also under bait).

PLANTS WHICH PROVIDE ESSENTIAL OILS

Pimenta racemosa (*Mill.*) *J. W. Moore.* (*Amomis caryophyllata* (Jacq.) Krug & Urban). Myrtaceae.

Bay Tree.

Oil of bay is distilled from the leaves. Plantations of this tree are on the mountains at the eastern part of St. John. Although the shape of the bay tree is naturally beautiful, the regular harvesting causes stunted and compact growth. There is a striking variation in the quality of the essential oil from individual trees. This is so pronounced that certain specimens are considered by the natives to be closely related but not the true bay. No attempts have been made to select high quality and high yielding trees for propagation.

Virgin Island bay rum is compounded in St. Thomas from the essential oil of St. John. Only five per cent of bay rum imports into the United States have this origin. Better distilling methods and better care of the trees would increase the yield of bay oil. The industry has never been considered important enough to carry on genetic and propagation studies with a view to improving quality and yield.

Coleus amboinicus *Loureiro.* Labiatae.

Wild Thyme.

Very strongly aromatic. In other parts of the American tropics this is called Spanish Thyme and is commonly seen in the markets.

Genipa americana *Linnaeus.* Rubiaceae.

RAT APPLE.

This tree which is so well known in the American tropics for its excellent wood is not common enough on St. John to be so used. The astringent pulpy interior of the unripe fruit when macerated yields a blue black dye. Although the pulp of the ripe fruit is eaten by many people, the natives of St. John do not eat it.

PLANTS USED AS SOAP

Sansevieria zeylanica *Willdenow.* Liliaceae.

LIZARD'S TAIL.

The leaves are crushed in water and are then used for washing and bleaching clothing.

Passiflora suberosa *Linnaeus.* Passifloraceae.

INK BERRY.

The crushed plant is said to make lather in water, while the crushed berry provides a natural "bluing." Both of these substances are used in washing clothing.

PLANTS USED FOR THEIR WOOD

Piper Amalago *Linnaeus.* Piperaceae.

BLACK WATTLE.

The stems are utilized in building small shelters or shacks much as bamboo is used.

Cecropia peltata *Linnaeus.* Moraceae.

TRUMPET WOOD.

The trunks, which have hollow internodes, are used for fish pot buoys.

Ficus laevigata *Vahl.* Moraceae.

MILK TREE.

The wood is used for charcoal.

Coccoloba uvifera *Linnaeus*. Polygonaceae.

SEA GRAPE.

The wood is used for boat timbers and for charcoal. (See also under food plants).

Trichostigma octandrum (*L.*) *H. Walter*. Phytolaccaceae.

BLACK HOOPWOOD.

The wood of this vine is peeled and used for the frames of baskets.

Annona glabra *Linnaeus*. Annonaceae.

BONYA, DOG APPLE.

The wood is used for heavy timbers. It is also in demand as fuel by the bake shops. It is sold by weight.

Capparis indica (*L.*) *Fawcett & Rendle*. Capparidaceae.

BLACK WITTY.

The wood is light, but very strong. It is used for axe handles and is split into long thin pieces for the frames of fish pots.

Hymenaea Courbaril *Linnaeus*. Leguminosae.

LOCUST.

The wood is used for furniture and charcoal.

Tamarindus indica *Linnaeus*. Leguminosae.

TAMARIND.

The wood makes good charcoal. (See also under food plants).

Inga laurina (*Sw.*) *Willdenow*. Leguminosae.

SWEET PEAS.

The wood is split into long thin strips for the frames of fish pots.

Acacia muricata (*L.*) *Sargent*. Leguminosae.

Dogwood.

The wood is used for fence posts and is split for fish pot braces. It also makes fair charcoal.

Andira inermis *Humboldt, Bompland & Kunth*. Leguminosae.

PigtuRd, Henkleit.

The wood is used in furniture making. (See also under medicinal plants).

Albizzia Lebbeck (*L.*) *Bentham*. Leguminosae.

Tipid, Woman's Tongues. (The latter common name is applied because the flat, paper-thin legume pods rustle in the slightest breeze and are said to be "whispering all the time").

The wood is excellent for furniture construction and makes a good grade of charcoal.

Leucaena glauca (*L.*) *Bentham*. Leguminosae.

Wild Tamarind.

The wood is used for making charcoal. (See also under food plants).

Erythrina Corallodendrum *Linnaeus*. Leguminosae.

Bombatel.

The wood is used in making charcoal.

Erythroxylon brevipes *De Candolle*. Erythroxylaceae.

Brizleit.

This tree provides one of the very best fence post woods. It commands a higher price than all other fence post woods except Black Torch.

Amyris elemifera *Linnaeus*. Rutaceae.

White Torch.

The wood gives a spicy and peppery odor when cut or sawed. It is a good wood for fence posts.

Xanthoxylum martinicense (*Lam.*) *De Candolle.* Rutaceae.

YELLOW PRICKLE.

This wood is used in building construction and in furniture making.

Xanthoxylum flavum *Vahl.* Rutaceae.

YELLOW SANDALWOOD.

This is the West Indian Satinwood of commerce. The wood is hard and much in demand for fine furniture and novelty manufacture.

Bursera Simaruba (*L.*) *Sargent.* Burseraceae.

TURPENTINE.

This tree is called Gumbo Limbo in Florida and Cuba, and West Indian Birch in the British West Indies. The wood is used for fence posts. Pieces put in the ground just after cutting will take root and form a living hedgerow.

Stigmaphyllon lingulatum (*Poir.*) *Small.* Malpighiaceae.

RED WISS.

The wood is used for the braces on fish pots.

Phyllanthus acidus (*L.*) *Skeels* (*Cicca disticha* L.) Euphorbiaceae.

GOOSEBERRY.

The wood is used for charcoal. (See also under food plants).

Gymnanthes lucida *Swartz.* Euphorbiaceae.

GOATWOOD.

The hard black heartwood of this small tree is highly prized for making walking sticks.

Spondias Mombin *Linnaeus.* Anacardiaceae.

PLUM.

When small trees or branches from larger trees are used for fence posts they take root and grow, providing a living hedgerow.

Schaefferia frutescens *Jacquin.* Celastraceae.

BOXWOOD.

The wood is used for fence posts and charcoal.

Maytenus sp. Celastraceae.

BUFLAMMAR.

The wood is used for charcoal and fence posts.

Serjania polyphylla (*L.*) *Radlkofer.* Sapindaceae.

BLACK WISS.

The wood is split into long thin pieces and used for the framing in fish pots.

Melicocca bijuga *Linnaeus.* Sapindaceae.

GUINIP, CANIP, KNIP.

The wood is split into long thin pieces for the frames of fish pots.

Krugiodendron ferreum (*Vahl*) *Urban.* Rhamnaceae.

EBONY.

This is one of the heaviest woods. It is used for fence posts.

Guazuma ulmifolia *Lamarck.* Sterculiaceae.

JACKOCALALOO.

The tough, strong wood of this tree is used for masts and booms on sloops and the handles of oars. Oar blades are made of lighter wood and are spliced onto the handles.

Rhizophora Mangle *Linnaeus.* Rhizophoraceae.

MANGROVE.

The wood is used for charcoal and for light construction.

Psidium amplexicaule *Persoon.* Myrtaceae.

SPICE GUAVA.

The wood, when cut, gives off the odor of Hubbard Squash. The heavy timber makes good charcoal.

Bucida Buceras *Linnaeus.* Combretaceae.

GRI-GRI.

The wood from this large forest tree provides excellent timbers for building. It was used for making ox carts some years ago.

Terminalia Catappa *Linnaeus.* Combretaceae.

ALMOND.

The wood is of good quality for general construction, but the tree is so prized for its beauty that a living tree would never be cut down for timber.

Psidium sp. Myrtaceae.

PIGEON BERRY TREE, MOUNTAIN GRAPE.

The tree grows to forty feet in height. The wood is used for timbers in building, for charcoal and for fence posts.

Tetrazygia angustifolia (*Sw.*) *De Candolle.* Melastomaceae.

SPRATWOOD.

The wood is used for fence posts.

Ardisia guadalupensis *Duchassaing ex Grisebach* Myrsinaceae.

BREAKBILL.

The wood is used for charcoal and for fence posts, but the latter only last about two years.

Manilkara nitida (*Sessé & Moç.*) *Dubard.* Sapotaceae.

BULLET WOOD.

This wood is heavy, but is excellent for furniture, and now that it is scarce, for novelties for the tourist trade.

Chrysophyllum sp. Sapotaceae.

MASTWOOD.

The common name is due to the tall straight trunk. The wood is used for beams in general construction and the smaller pieces for fence posts and charcoal.

Chrysophyllum pauciflorum *Lamarck.* Sapotaceae.

PALMET.

The wood is excellent for house construction, timbers for boats, fence posts and charcoal.

Beurreria succulenta *Jacquin.* Boraginaceae.

CHING.

The wood is used for fence posts.

Cordia alliodora (*Ruiz & Pav.*) *Chamisso.* Boraginaceae.

COPPER.

The hard wood is used in making oar handles, cartwheels, vehicles, furniture and in general construction. It was used for yokes for oxen in the old days.

Cordia glabra *Linnaeus.* Boraginaceae.

MANJACK.

This light wood makes fair charcoal.

Cordia nitida *Vahl.* Boraginaceae.

BASTARD MANJACK, BASTARD COPPER.

These two common names distinguish this tree from

C. glabra and *C. alliodora*, which are called Manjack and Copper respectively.

The wood is used for studding in building construction and for oar handles.

Citharexylum fruticosum *Linnaeus.* Verbenaceae.

FIDDLEWOOD.

The wood is pink when cut, but fades out in a few days. Adventitious buds develop profusely, filling the lower part of the tree with sucker growth. The wood makes good fence posts.

Tabebuia pallida *Miers.* Bignoniaceae.

CEDAR.

This wood is much prized for general construction.

Tabebuia heterophylla (*DC.*) *Britton.* Bignoniaceae.

CEDAR.

This tree provides excellent timber for house construction and boat building. The yoke piece of the rudder on sailing boats is usually made from cedar.

Erithalis fruticosa *Linnaeus.* Rubiaceae.

BAY TORCH.

The wood is used for fence posts.

Exostemma caribaeum (*Jacq.*) *Roemer & Schultes* Rubiaceae.

BLACK TORCH.

The wood is used for building wharves because marine worms will not attack it. It is the very best of the many woods used for fence posts.

Genipa americana *Linnaeus.* Rubiaceae.

RAT APPLE.

This tree is not common on St. John. The wood is hard and heavy and is suitable for general construction.

Guettarda scabra (*L.*) *Lamarck*. Rubiaceae.

GREENHEART.

This is not the Greenheart of British Guiana. The wood is used for fence posts, but it does not last well.

Coccothrinax argentea (*Lodd.*) *Sargent*. Palmae.

TYPE PALM.

This common dwarf palm is a very important plant to the natives. Both the blades and petioles of the leaves are utilized in making baskets, hats, ropes, mats and fish pots.

Trichostigma octandrum (*L.*) *H. Walter*. Phytolaccaceae.

BLACK HOOPWOOD.

The wood is peeled and used in basketry, especially for the frames.

Centrosema virginianum (*L.*) *Bentham*. Leguminosae.

BLUE WISS.

This very common vine is one of the most useful fibre yielding plants. The small stems are used for basketry, weaving, string and rope. This plant is also referred to under edible plants.

Serjania polyphylla (*L.*) *Radlkofer*. Sapindaceae.

BLACK WISS.

The small stems are used for making thongs, ropes and mats. This is the fibre which is always utilized in braiding the "rope" which connects the fish pot to the fish pot buoy.

Daphnopsis caribaea *Grisebach.* Thymelaeaceae.

MAHO.

The inner bark is naturally woven in such a manner that pieces several yards long can easily be stripped off. These are very strong. They are braided into rope.

ORNAMENTAL PLANTS

Crotalaria retusa (*L.*) *Swartz.* Leguminosae.

EARRING PLANT.

The hard ripe black pods are used by the children to make earrings. There is enough spring in the stem end of the pod to hold them on.

Crotalaria verrucosa *Linnaeus.* Leguminosae.

EARRING PLANT.

Pods used as above.

Phaseolus lathyroides *Linnaeus.* Leguminosae.

The large purple flowers are used for decorative purposes. This plant has garden possibilities.

Gliricidia sepium (*Jacq.*) *Steudel.* Leguminosae.

MADRE DE CACAO.

Of considerable decorative value, this species is much more important as a food plant for cattle. (See food plants).

Spondias Mombin *Linnaeus.* Anacardiaceae.

PLUM.

A fine shade tree. (See also food and wood plants).

Terminalia Catappa *Linnaeus.* Combretaceae.

ALMOND.

One of the finest shade trees of the warmer regions. The leaves turn a beautiful orange at the close of the wet season. (See also under food and wood plants).

Jacquinia Barbasco (*Loefl.*) *Mez.* Theophrastaceae

No local name.

This tree is particularly notable for the fragrance of its flowers.

Plumeria alba *Linnaeus.* Apocynaceae.

Frangipani.

The fragrant white flowers are used for decoration.

Exogonium repandum (*Jacq.*) *Choisy.* Convolvulaceae.

This common vine with its striking clusters of red flowers is particularly notable along the trails in January. It is sometimes transplanted from the wild to the houses as a porch runner.

Ipomoea carnea *Jacquin.* Convolvulaceae.

This large red-flowered morning glory is a common beach runner.

Ipomoea tricolor *Cavanilles.* Convolvulaceae.

Morning Glory.

Several acres of this "heavenly blue" in full bloom running over the fields, trails and shrubs at Christmas time furnished a natural profusion of color not easily described.

Jacquemontia pentantha (*Jacq.*) *Don.* Convolvulaceae.

Wild Daisy.

This is one of the bright spots of the island flora. The small vine is very common in fields and hedgerows. It bears a profusion of bell-shaped blue flowers, about one inch across, and blooms continuously.

Merremia dissecta (*Jacq.*) *Hallier filius.* Convolvulaceae.

Nio.

A beach runner. Flowers white with purple stripes.

Merremia umbellata (*L.*) *Hallier filius.* Convolvulaceae.

No local name.

A beach runner.

Lantana involucrata *Linnaeus.* Verbenaceae.

Growing on rocks at the sea side. Lilac flowers and dark purple fruit. An excellent decorative shrub.

Leonurus sibiricus *Linnaeus.* Labiatae.

The axillary whorls of pink-purple flowers makes this a good garden plant.

Spathodea campanulata *Beauvois.* Bignoniaceae.

African Tulip Tree.

This very showy tree with large scarlet flowers is commonly planted for decoration.

Randia aculeata *Linnaeus.* Rubiaceae.

Christmas Tree.

This small tree, with open branching, bears many small, tough, dark blue-green waxy leaves. The flowers are small, white and very fragrant. This is the local Christmas tree. Decorated with colored shells and sea urchins it is quite festive.

Verbesina alata *Linnaeus.* Compositae.

The deep orange flowering heads suggest excellent garden possibilities.

NOXIOUS PLANTS AND WEEDS

Argemone mexicana *Linnaeus.* Papaveraceae.

Thistle.

This is one of the prickly-poppies, not a thistle. It

thrives in the open fields, quickly spoiling good pasture land if not eliminated.

Leucaena glauca (*L.*) *Bentham*. Leguminosae.

WILD TAMARIND.

This weedy shrub rapidly takes possession of any territory available. It has overgrown some of the trails rendering them impenetrable. (See also under edible and wood producing plants).

Acacia riparia *Humboldt, Bonpland & Kunth.* Leguminosae.

CATCH AND KEEP.

A very common and rapidly spreading vine. The stems are covered with small retrorse barbs, like tiny cat's claws, which cause severe skin lacerations. Public enemy number one of St. John.

Cuscuta americana *Linnaeus*. Convolvulaceae.

YELLOW LOVE.

This dodder infests many species of the island flora. At times the individual plants cover the vegetation on several hundred square feet of ground. It is also a medicinal plant.

MISCELLANEOUS USEFUL PLANTS

Bambusa sp. Gramineae.

BAMBOO.

The small stems serve as fish poles. Large stems, five inches in diameter, are cut into sections for floats, for fish pots and for seines. The mature dried stems are used in general construction, as poles for small craft, and in many incidental ways.

Caesalpinia divergens *Urban*. Leguminosae.

NICOL, NIKKER NUT.

This large climbing shrub sometimes covers the Sea Grape and other trees at the back of the beaches. The large pods contain almost spherical, hard coated, grey seeds about the size of Concord grapes. The children use these as marbles and for other games.

Crescentia Cujete *Linnaeus.* Bignoniaceae.

Gourd Tree.

This is the well known calabash. The hard shell of the fruit, which may attain a diameter of twelve inches, is used for dippers, dishes, vessels, cups, trays, toys, novelties for tourists and for ash trays. This plant is also referred to under medicinal plants.

AN ORCHID NOVELTY FROM FIJI

BY

CHARLES SCHWEINFURTH

DURING THE COURSE of identifying an interesting collection of orchids recently gathered in Fiji by Mr. William Greenwood of Lautoka, Viti Levu and sent to Dr. A. C. Smith of the Arnold Arboretum, I detected the following novelty.

In a genus which is characterized by a close similarity of the flower-parts, the principal means of specific separation appears to rest on vegetative characters.

Pseuderia Smithiana *C. Schweinfurth* var. **amplifolia** *C. Schweinfurth var. nov.*

Herba foliis ovato-lanceolatis vel oblongo-lanceolatis cum basi lata valde obliqua a specie praecipue differt.

Plant differing from the type chiefly in the form and proportions of the leaves. Leaves ovate-lanceolate or oblong-lanceolate, long-acuminate, very oblique at the broad sessile base, up to 13.2 cm. long and 4.3 cm. wide near the base. Bracts as in the type. Sepals and petals yellowish green with streaks and spots of reddish brown.

The ovate-lanceolate leaves with their very asymmetric broad basal portion give to this plant an appearance very dissimilar to that of the typical form which has narrowly lanceolate or oblong-lanceolate leaves with a narrowly cuneate base and a maximum width of 2.4 cm. The flowers of the species are said to be yellow or cream-color with red or purple spots.

FIJI: Viti Levu, Lautoka, Mt. Evans, at about 1100 meters altitude, climbing up trunks of trees to 15 feet with horizontal or slightly dependent shoots 1–1.5 feet long, October 25, 1942, *William Greenwood 661 D* (TYPE in Herb. Ames No. 61891); Vanua Levu, Thak-

aundrove, Maravu, near Salt Lake, at 0–450 meters altitude, scrambling over branches and trunks of trees in open forest, January 17–23, 1941, *O. Degener & E. Ordonez 14171;* Vanua Levu, Thakaundrove, Savu Savu Bay region, Uluinabathi Mt., at 0–400 meters altitude, sprawling branching herb, on shrubby ledges, December 26, 1940–January 10, 1941, *Degener & Ordonez 13943.* (This collection is in an advanced stage lacking good flowers and consequently is placed here with some hesitation).

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STUDIES IN HABENARIA AND DICHAEA

BY
OAKES AMES AND DONOVAN S. CORRELL

I. THE PROBLEM OF HABENARIA FLAVA

HABENARIA, the largest genus of native orchids in the United States and Canada, presents some complex and extremely difficult taxonomic and nomenclatorial problems. This is especially true of the sections *Limnorchis* and *Piperia* in the western United States and Canada. The most confusing problem in the eastern United States and Canada involves the much misunderstood *H. flava* (L.) R. Br. This is due not only to the variability of the species itself, and to the inclination of some authors to segregate entities based on minor variations, but also to the fact that some forms of *H. flava* are superficially similar to some forms of *H. viridis* (L.) R. Br. var. *bracteata* (Muhl.) Gray. This superficial resemblance is especially true of herbarium specimens.

Although Ames, in 1910, recognized the existence of two forms of *H. flava*, he included them under one concept. He wrote (Orchidaceae, fasc. 4, p. 44): "*Habenaria flava* is represented by two forms, one of which is common in the northern United States. That these forms are specifically or even varietally distinct from one another is very doubtful. The specimens in the Linnaean and Gronovian herbaria [*Orchis flava*] are comparable to the specimens with elongated racemes frequently found in

the South and Southwest. The specimen in Lindley's herbarium at Kew which represents *Platanthera herbiola* Lindl. is comparable to the form with congested racemes not uncommon in the New England states . . . "

It now seems best to recognize two variants in this species, based not only on distribution and the difference in habit but also on floral differences. The typical form, *H. flava*, is primarily southern in distribution. The more northern variant, based on *Platanthera herbiola*, has in the past been recognized by some authors as *Habenaria flava* var. *virescens* (Muhl. ex Willd.) Fernald. However, as pointed out below, *Orchis virescens* Muhl. ex Willd., upon which the above combination is based, is doubtless referable to *H. viridis* var. *bracteata*.

Habenaria flava (*L.*) *R. Brown* in Sprengel Syst. Veg. 3 (1826) 691.

Orchis flava Linnaeus Sp. Pl. (1753) 942.
Orchis bidentata Elliott Sketch Bot. S.C. and Ga. 2 (1824) 488.
Orchis scutellata Nuttall in Trans. Am. Phil. Soc. n.s. 5 (1834) 161.
Platanthera flava Lindley Gen. & Sp. Orch. Pl. (1835) 293.
Platanthera fuscescens Kränzlin Orch. Gen. & Sp. 1 (1899) 637, 943, in part as to Am. syn.
Perularia bidentata Small Fl. Southeastern U.S. ed. 2 (1913) 314.
Perularia scutellata Small Fl. Southeastern U.S. ed. 2 (1913) 314.
Perularia flava Schlechter in Fedde Repert. 16 (1919) 286, as to name only.

The type of *Orchis flava*, from Virginia, in the Linnaean Herbarium (examined by Ames) is a plant, the lower part of which is missing, with a solitary leaf and a

subscapose raceme of scattered flowers. The lowermost bracts of the raceme slightly exceed the flowers, but the uppermost bracts are about equal to or shorter than the flowers. An examination of a specimen in the Ames Herbarium from Early Co., Georgia (*R. M. Harper 1909*), which was compared by Ames with the type of *Orchis flava* and with the specimen in the Gronovian Herbarium, reveals that it is also the characteristic plant found in the southern and southwestern United States. The lip of the flowers in this collection is scarcely or only shallowly toothed at the base. A specimen of this collection in the New York Botanical Garden Herbarium is determined as *Perularia scutellata* (Nutt.) Small.

In 1824, Elliott described *Orchis bidentata* from the "... middle districts of Georgia and Carolina." His description of this segregate agrees closely with typical *H. flava*, and an examination of the scapose inflorescence of Elliott's putative type in the Charleston Museum shows that it is similar to the Linnaean plant.

In 1834, Nuttall described *Orchis scutellata* from Arkansas. His description of the plant is, in part, as follows: "... Stem angular, about a foot high, bearing two distant, unequal, lanceolate, acute leaves, and two or three bracts below the commencement of the spike; floral bracts acute and sheathing, each about the length of the germ [ovary]; flowers remote, forming a scattered spike three to four inches long; ... [petals] a little crenulated along the margin in common with the lip, ... the lip somewhat longer than the lateral segments, partly oblong-oval, emarginate at the extremity, and at its commencement producing a denture on either side, and one protuberant or central elevation."

Small, in 1913 (Fl. Southeastern U.S. ed. 2, p. 314), maintained *Perularia bidentata* (*Orchis bidentata*) and *P. scutellata* (*Orchis scutellata*) as distinct from *P. flava*. He

separated these two concepts from *P. flava* on the basis that the lip was about as wide as long, instead of being longer than wide, and the floral bracts were mostly shorter than the flowers. These two characters attributed to *P. bidentata* and *P. scutellata* are referable to typical *H. flava*. In separating *P. scutellata* from *P. bidentata*, Small intimates in his key and description that *P. scutellata* lacks basal lateral teeth. He says of *P. scutellata:* " . . . bracts shorter than the flowers: . . . lip suborbicular or broadly oval in outline. . . . " Nuttall clearly stated that the lip of his plant produced a "denture" on each side at the base.

The flowers in a collection from McCreary Co., Kentucky (*F. T. McFarland & H. J. Rogers 99*) were found to have a lip which is essentially entire. Another collection from Shannon Co., Missouri (*E. J. Palmer 34828*) was found to have flowers with rather large rhombic-ovate petals and a prominent lobule, instead of a tooth, on each side of the lip; the lobules being somewhat crenate and the tubercle on the face of the lip extremely elongated and conspicuous. These two specimens represent extreme conditions of *H. flava*.

Habenaria flava may be briefly described as follows: Plant 1.5–6 dm. tall; stem slender, with two or occasionally three leaves below, long-bracted above, provided on the lower part with one or more tubular sheaths; leaves usually two, distant, oblong-elliptic to narrowly lanceolate, subobtuse to acuminate and attenuate, sheathing the stem, 7–20 cm. long, 1.2–5 cm. wide; raceme subscapose, usually short-bracted, laxly flowered, cylindrical, 6–20 cm. long, 1.2–2 cm. in diameter; floral bracts narrowly lanceolate, acuminate, usually equalling or shorter than the flowers; sepals ovate-oblong to rhombic-ovate or suborbicular, subobtuse to rounded at the more or less crenulate apex, 2–5.5 mm. long, 1.5–2.5 mm. wide;

petals obliquely oblong to orbicular, rounded to obtuse at the more or less crenulate apex, 2–5 mm. long, 1.5–4 mm. wide; lip ovate to suborbicular or suborbicular-quadrate, rarely oblong, with or sometimes without a tooth on each side at the base, occasionally with the lateral teeth prominent, more or less crenulate on the margins, provided with a tubercle on the median face below the middle, 2.2–6 mm. long, 2–5 mm. wide across the basal teeth or lobules, usually almost as wide as long; spur cylindrical and slender or slender-clavellate, 4–9 mm. long; capsule obliquely ellipsoid, about 8 mm. long.

Habenaria flava is commonly found in open woods in floodplain areas of streams and in wet soil of thickets, meadows and swales. It is also found in sphagnum bogs, swamps and in gravelly soil on the margin of lakes and streams.

This species is primarily a plant of the Atlantic Coastal Plain and Gulf Coast. It is now known to occur from central Florida along the coast to Maryland, with a disjunct area in Nova Scotia, along the Gulf Coast and Piedmont Plateau to Texas, on the Cumberland Plateau in Tennessee and Kentucky, and in the Mississippi drainage basin in Arkansas, Tennessee, Missouri, Illinois and Indiana.

Habenaria flava (*L.*) *R. Brown* var. **herbiola** (*R. Br.*) *Ames & Correll comb. nov.*

Habenaria herbiola R. Brown in Aiton Hort. Kew. ed. 2, 5 (1813) 193.

Orchis fuscescens Willdenow *sensu* Pursh Fl. Am. Septentr. 2 (1814) 587, not Linnaeus, not Gmelin.

Orchis herbiola Pursh Fl. Am. Septentr. 2 (1814) 743.

Habenaria fuscescens Torrey Comp. Fl. Northern and Middle States (1826) 318.

Orchis glareosa Rafinesque in Atlant. Journ. 1 (1832) 150.

Orchis fuscata Rafinesque in Atlant. Journ. 1 (1832) 150.
Platanthera herbiola Lindley Gen. & Sp. Orch. Pl. (1835) 287.
Tulotis fusescens Rafinesque Fl. Tellur. 2 (1836) 37.
Tulotis herbiola Rafinesque Fl. Tellur. 2 (1836) 37.
Perularia viresens A. Gray in Bot. Gaz. 5 (1880) 63, as to plant, not as to name.
Platanthera fuscescens Kränzlin Orch. Gen. & Sp. 1 (1899) 637, 943, in part as to Am. syn.
Perularia flava Farwell in Eleventh Ann. Rept. Commissioners Parks and Boulevards Detroit (1900) 54—Rydberg in Britton Man. Fl. Northern States and Canada (1901) 292—Small Fl. Southeastern U.S. ed. 2 (1913) 314.
Habenaria flava var. *viresens* Fernald in Rhodora 23 (1921) 148, in footnote, as to plant, not as to name.

In 1813, Robert Brown described *Habenaria herbiola* from ". . . North America." His description of the plant is as follows: "H. cornu filiforme germine breviore, labello oblongo obtuso basi utrinque dentato; palato unidentato, bracteis flore longioribus."

Later, in 1835, Lindley, in making the combination *Platanthera herbiola*, wrote: "*O. scutellata* of Nuttall seems to differ in nothing except its lip being emarginate." An examination of a specimen in the Ames Herbarium from Plymouth Co., Massachusetts (*C. Blomberg*) which was compared by Ames with *Platanthera herbiola* at Kew and with specimens in the Nuttall Herbarium labelled *Orchis herbiola*, reveals that it is the northern form with short-pedunculate stem and congested raceme with elongated floral bracts exceeding the flowers.

Small, in 1913, treated this northern form of the species as *Perularia flava*. He wrote: ". . . bracts mostly longer than the flowers: . . . lip hastate, the middle lobe

oblong to lanceolate, . . . In swamps and marshes, Ontario to Minnesota and Louisiana." Later, in 1933 (Man. Southeastern Fl., p. 371), despite the fact that *Orchis flava* was originally described from Virginia, Small gave its distribution as ". . . various provinces rarely E of Blue Ridge, La. to Minn., Ont., and N. S."

It is of interest to note that a specimen in the Ames Herbarium from Franklin Co., Vermont (*E. Brainerd*) has flowers whose lip is narrowly linear-oblong and entire or with only an incipient tooth on one or both sides at the base.

Variety *herbiola* is distinguished from the typical form of the species in that the plant is more robust and the usually broader leaves, which may be as many as five, extend further up the stem. The raceme is also more compact with the longer floral bracts often much exceeding the flowers. The characteristically oblong-quadrate, instead of ovate to suborbicular, lip of var. *herbiola* which is longer than wide is a distinctive feature by which to separate these two entities.

Variety *herbiola* is found in the same type of habitat as the typical form. However, it is sometimes found in dry sterile soil and dry sedge marshes. It is now known to occur from Nova Scotia, New Brunswick, Quebec and Ontario through New England, New York and Pennsylvania to Maryland, south along the Allegheny Mountains through West Virginia and Virginia to North Carolina and Tennessee, westward through Ohio, Indiana, Illinois and Wisconsin to Minnesota and Missouri.

Habenaria viridis (*L.*) *R. Brown* var. **bracteata** (*Muhl.*) *A. Gray* Man. Bot. Northern U.S. ed. 5 (1867) 500.

Orchis bracteata Muhlenburg in Willdenow Sp. Pl. 4 (1805) 34.

Orchis viresens Muhlenburg in Willdenow Sp. Pl. 4 (1805) 37.
Orchis bracteatis Salisbury Parad. Lond. (1805) t. 110.
Satyrium bracteatum Persoon Syn. Pl. 2 (1807) 507, non Lindl.
Satyrium viresens Persoon Syn. Pl. 2 (1807) 507.
Satyrium bracteale Salisbury in Trans. Hort. Soc. 1 (1812) 290.
Habenaria bracteata R. Brown in Aiton Hort. Kew. ed. 2, 5 (1813) 192.
Orchis viridis Willdenow *sensu* Pursh Fl. Am. Septentr. 2 (1814) 587, excl. syn. in part.
Orchis flava var. *viresens* Green in Trans. Soc. Prom. Useful Arts 3 (1814) 120 (Cat. Pl. Indig. N.Y. (1814) 60).
Habenaria viresens Sprengel Syst. Veg. 3 (1826) 688.
Gymnadenia viridis Sprengel Syst. Veg. 3 (1826) 693, in part.
Habenaria viridis R. Br. *sensu* Chamisso in Linnaea 3 (1828) 31, as to distribution, not as to name.
Gymnadenia bracteata Presl Rel. Haenk. (1830) 92.
Orchis viridis β Vaillanti Tenore Syll. Add. (1831) 629.
Peristylus bracteatus Lindley Gen. & Sp. Orch. Pl. (1835) 298.
Peristylus viresens Lindley Gen. & Sp. Orch. Pl. (1835) 298.
Platanthera bracteata Torrey Fl. N.Y. 2 (1843) 279.
Platanthera viridis var. *bracteata* Reichenbach filius Orch. Europ. (1851) 130, t. 83 (435).
Coeloglossum Vaillantii Gussoni in Reichenbach filius Orch. Europ. (1851) 130.
Coeloglossum bracteatum Parlatore Fl. Ital. 3 (1860) 409, in text.
Peristylus bracteatus f. *major* Franchet & Savatier Enum. Pl. Jap. 2 (1877) 31 (1879) 513.

Perularia virescens A. Gray in Bot. Gaz. 5 (1880) 63, as to name, not as to plant.
Coeloglossum viride b) *bracteatum* Richter Pl. Europ. 1 (1890) 278.
Peristylus viridis var. *bracteata* Reichenbach filius ex Kurtz in Engl. Bot. Jahrb. 19 (1894) 408.
Platanthera Chorisiana Kränzlin Orch. Gen. & Sp. 1 (1899) 1, as to characters of the labellum and fig. in Reichenbach filius Orch. Europ.
Platanthera viridis Lindley *sensu* Finet in Bull. Soc. Bot. Fr. 47 (1900) 284, in part.
Habenaria flava var. *virescens* Fernald in Rhodora 23 (1921) 148, in footnote, as to name, not as to plant.

In 1805, Muhlenburg described *Orchis virescens* from Pennsylvania. He wrote: "O. labello lanceolato crenato, petalis conniventibus, cornu [spur] obtuso scrotiformi, bracteis flore longioribus . . . . Flores *virescentes* . . . . Labellum *lanceolatum crenatum*. Cornu *obtusum scrotiforme brevissimum*."

Later, in 1826, Sprengel, in making the combination *Habenaria virescens*, said that the spur was obtuse and didymous. Still later, in 1835, in making the combination *Peristylus virescens*, Lindley wrote: "Unknown to North American botanists. Is it some state of *Peristylus viridis*, or *bracteata?*"

It is strange that Lindley's question did not provoke later botanists to investigate more thoroughly the plant or description of the concept in question. It is clear to us that the plant originally described as *Orchis virescens* is referable to *H. viridis* var. *bracteata* instead of *H. flava* to which species it has formerly been referred. The combination of characters attributed to *O. virescens*—lanceolate (often used for oblanceolate during Muhlenburg's time) lip which may be interpreted as being "crenato" at the apex; connivent petals and sepals; short, obtuse,

serotiform spur; and long bracts exceeding the flowers —could be referable only to *H. viridis* var. *bracteata*. Muhlenburg does not mention the lip as having a tubercle on its face, a character of *H. flava*. The spur of *H. flava* and its var. *herbiola* is never serotiform, but is cylindrical and slender-elongated or somewhat clavellate.

Specimens in the Muhlenburg Herbarium in the Academy of Natural Sciences of Philadelphia afford little satisfaction toward solving this problem. According to Dr. F. W. Pennell, the folder marked *Orchis virescens* is in the handwriting of Dr. R. E. Griffith, Curator of the collections of the American Philosophical Society about 1830. Included in this folder are specimens of *Habenaria integra* (Nutt.) Spreng. and *H. flava* var. *herbiola*. These are doubtless the plants which were merely interpreted by Griffith to be *Orchis virescens* and, consequently, should not be considered as authentic.

II. Dichaea echinocarpa and its Allies

The genus *Dichaea* is a very natural assemblage of species. However, because of the close affinity of the species, several of them are extremely difficult to define. In such a genus where various species are almost identical vegetatively, it is essential to make a floral dissection before an accurate determination is possible. It is also to be expected that natural hybrids will occur because often several species may grow matted and entwined on the same tree or rock, thus affording easy cross-pollination. This creation of a hybrid population adds to the perplexity of identifying some of the species or so-called species. Another disturbing fact is that numerous sterile specimens have been collected which are, for the most part, indeterminable and thus the material with which to work is limited.

The species of *Dichaea* treated here belong to the sec-

tion Eudichaea, characterized by having persistent leaves which are continuous with the leaf-sheaths.

Dichaea echinocarpa (*Sw.*) *Lindley* Gen. & Sp. Orch. Pl. (1833) 208, exclude synonymy in part.

Epidendrum echinocarpon Swartz Prodr. Veg. Ind. Occ. (1788) 124, exclude synonymy.

Cymbidium echinocarpon Swartz in Nov. Act. Ups. 6 (1799) 71, exclude synonymy in part.

Pachyphyllum echinocarpon Sprengel Syst. Veg. 3 (1826) 731.

We consider the interpretation of this species by Fawcett and Rendle (Flora of Jamaica 1 (1910) 136, t. 30, figs. 26–30) to be correct. The lip (fig. 1) is essentially entire with only a slight dilation on each side above the middle or near the apex. The leaves (fig. 3) of *D. echinocarpa* are as a rule sufficiently different from those of *D. muricata* (fig. 4) to facilitate the separation of these often confused species. The thin-herbaceous, elliptic-lanceolate leaves of *D. echinocarpa* taper to a long-apiculate to acuminate apex, whereas the leaves of *D. muricata* are thick-subcoriaceous, ovate-elliptic to oblong-elliptic and rounded and apiculate at the apex.

Since it was originally described, this species has been confused with the invalid *Limodorum pendulum* Aubl. This confusion resulted from the citation by Swartz of *Limodorum pendulum* as a synonym of his *Epidendrum echinocarpon*. Lindley perpetuated this error by citing *Limodorum pendulum* as a synonym when he made the combination, *Dichaea echinocarpa*. The invalidity of *Limodorum pendulum* is discussed later.

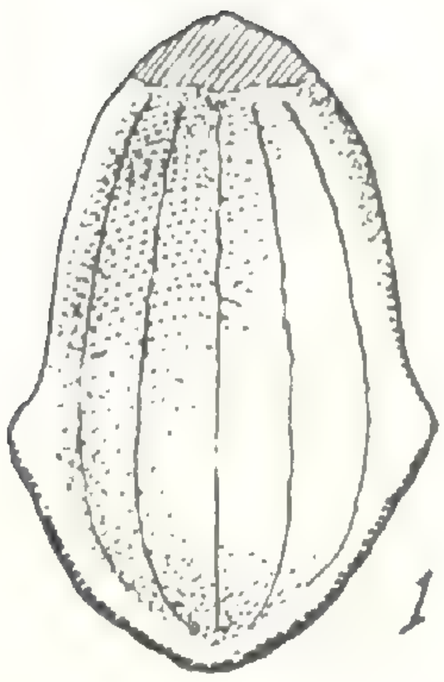
This species is rare in Costa Rica; it is widespread but not common throughout the West Indies. It is found on trees and shaded rocks in forest, and grows up to 2400 meters altitude in Costa Rica.

EXPLANATION OF THE ILLUSTRATION

PLATE IV. 1, DICHAEA ECHINOCARPA (*Sw.*) *Lindl.*, lip, front view, five times natural size. 2, D. ECHINOCARPA var. LOBATA *Ames & Correll*, lip, front view, five times natural size. 3, D. ECHINOCARPA, section of stem showing leaves, natural size. 4, D. MURICATA (*Sw.*) *Lindl.*, section of stem showing leaves, natural size.

Drawn by G. W. DILLON

Plate IV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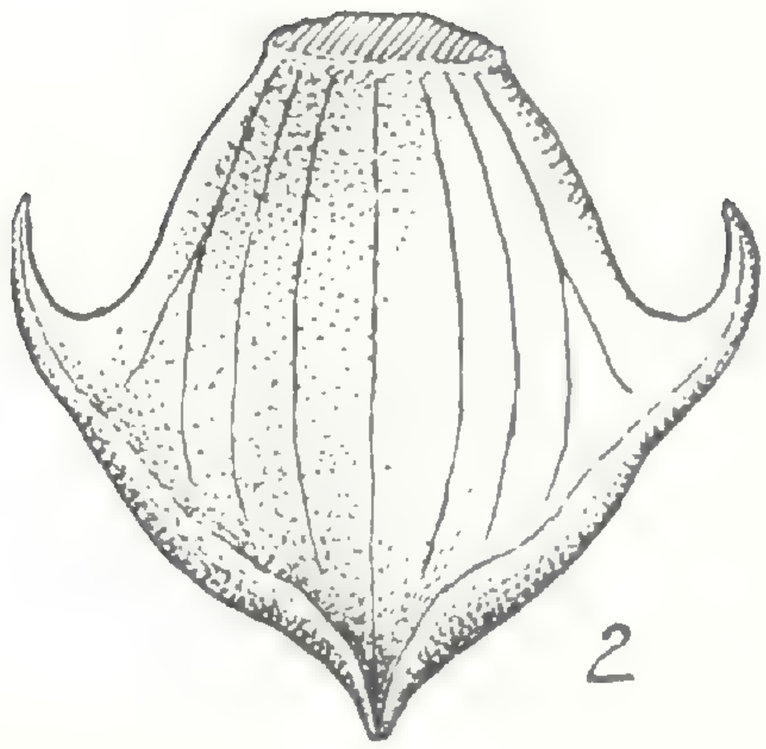
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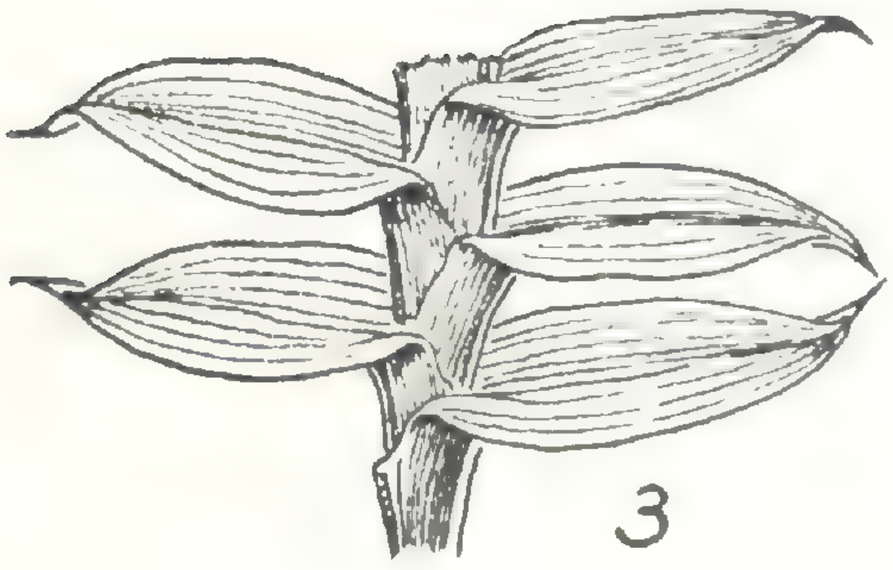
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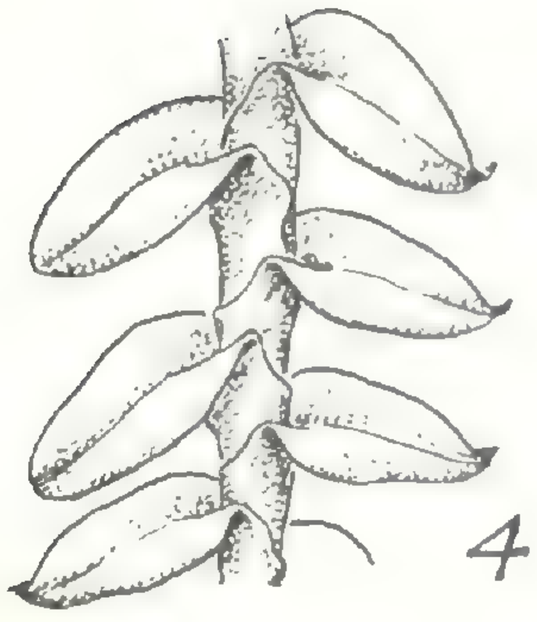

4

Costa Rica: La Palma, *A. M. Brenes 483* (Herb. Ames); [San Mateo], *A. M. Brenes 482* (Herb. Ames).

Jamaica: Blue Mt., Marce's Gap, *M. A. Chrysler* (Herb. Ames); Marce's Gap, *G. E. Nichols 45* (Herb. Gray); Portland Gap and vicinity, *W. R. Maxon 9798* (Herb. Ames); Marce's Gap to Vinegar Hill, vicinity of Cinchona, *N. L. Britton 213* (Herb. Ames); east of Cuna Cuna Gap, St. Thomas, *W. R. Maxon 9433* (Herb. Ames).

Puerto Rico: Vicinity of Ala de la Piedra above Villalba, *N. L. Britton & F. S. Earle 6103* (Herb. Ames).

Haiti: Massif de la Telle, Morne Brouet, on the slope towards Rivière Corail, *E. L. Ekman 1348* (Herb. Ames).

Santo Domingo: Barahona, *Pater Fuertes 680* (Herb. Ames).

Cuba: "Cuba Orientali," *C. Wright 646, 1702* (Herb. Gray) (both specimens labelled *Dichaea muricata* Lindl., cited as *D. pendula* by Cogniaux in Urban Symb. Antill. 6 (1910) 670 and by Kränzlin in Engler Pflanzenreich IV. 50 (Heft 83) (1923) 38.

Dichaea echinocarpa (*Sw.*) *Lindley* var. **lobata** *Ames & Correll var. nov.*

Herba speciei formae typicae est similis praeterquam quod labellum lobos laterales distinctos graciles habet.

Variety *lobata* is vegetatively identical with the typical form of the species. However, the lip (fig. 2), instead of being essentially entire as in the typical form (fig. 1), has the lateral dilations produced into distinct, slender, more or less recurved lobes. The lip approaches in form that of *D. muricata*. However, var. *lobata* is readily separated from that species by its thin-herbaceous, elliptic-lanceolate leaves which taper to a long-apiculate to acuminate apex. The leaves of var. *lobata* are up to 2.5 cm. long and 1 cm. wide below the middle.

Costa Rica: San José, La Palma, altitude about 1600 meters, on mossy tree trunk, *P. C. Standley 33120* (Type in Herb. Ames No. 30208, in part); San José, La Palma, altitude about 1600 meters, on mossy tree trunk, flowers dull yellow, lip pinkish white, *P. C. Standley 33150* (Herb. Ames); Cartago, El Muñeco, on the Rió Navarro, altitude 1400–1500 meters, on tree, *P. C. Standley & J. Valerio 51703* (Herb. Ames).

×**Dichaea intermedia** *Ames & Correll hybr. nov.*
(*D.squarrosa* Lindley×*D.trichocarpa* (Sw.) Lindley)

Folia linearia vel lineari-lanceolata, obtusa et apiculata usque ad acuminata vel angustata et longe apiculata. Sepala ovato-elliptica vel elliptico-lanceolata, obtusa vel subacuminata. Petala oblongo-elliptica vel elliptico-oblanceolata, acuta vel apiculata. Labellum carnosum, in circuitu late oblongo-quadratum, concavum, lobulo parvo angulari prope apicem utrinque instructum. Columna brevis, carnosa, ligula parva erecta subglabra vel ciliata antice ornata.

This natural hybrid is vegetatively similar to *D.trichocarpa*. However, florally, it is more or less intermediate between the above-mentioned species and *D.squarrosa*. Its fleshy-thickened leaves, which are 7–17 mm. long and 2–3 mm. wide, are typically linear to linear-lanceolate and acuminate or tapering and long-apiculate as in *D. trichocarpa*. They are, however, sometimes obtuse and apiculate as in *D.squarrosa*. The lip and column (fig. 2a) are distinctly intermediate between those of the putative parents. The lip, which is 6–7 mm. long and 3–4 mm. wide across the middle, is fleshy and concave, broadly oblong-quadrate in outline (fig. 2b), with a small angular lobule on each side near the apex. The broad, concave basal half of the lip resembles the condition found in *D. trichocarpa*, whereas the somewhat spreading, not strongly conduplicate, apical half resembles the typical lip of *D. squarrosa*. The column (fig. 2a) is short and fleshy, being 3–4 mm. long, and is provided with a small, erect, nearly glabrous to ciliate ligule on the ventral surface. The sepals, which are 8–10 mm. long and 3.2–5 mm. wide, are ovate-elliptic to elliptic-lanceolate and obtuse to subacuminate. The petals, which are 7–9 mm. long and 2.5–4 mm. wide, are oblong-elliptic to elliptic-oblanceolate and acute to apiculate. The flowers are described

by collectors as "white and bluish, very fragrant," "white with purplish infusion," and "lip bluish purple and white."

It is seldom that such a distinctive natural hybrid is found in the Orchidaceae. ×*Dichaea intermedia* has been found only in Mexico and Guatemala where it is epiphytic on trees in humid forests up to 1500 meters altitude.

Mexico: Vera Cruz, Santa Ana, *C. A. Purpus 4443* (Herb. Gray); Vera Cruz, Orizaba, *Botteri 524, 892* (Herb. Gray); Vera Cruz, Tlapacayan, *M. B. Foster 12, 13* (Herb. Ames); Oaxaca, near Copalita, region Pluma Hidalgo, *O. Nagel 5295* (atypical) (Herb. Ames); Chiapas, near settlement "La Silva," *O. Nagel 5615* (Herb. Ames).

Guatemala: Alta Verapaz, Cobán, *H. von Tuerckheim II 1798* (Type in Herb. Gray); Alta Verapaz, Pansamalá, *H. von Tuerckheim 1247* (Herb. Gray); Alta Verapaz, Cobán, *W. C. Muenscher 12531* (Herb. Field Mus.); Alta Verapaz, Samác, *H. Johnson 297* (Herb. Ames).

Dichaea trichocarpa (*Sw.*) *Lindley* Gen. & Sp. Orch. Pl. (1833) 209.

Epidendrum trichocarpon Swartz Prodr. Veg. Ind. Occ. (1788) 124.

Cymbidium trichocarpon Swartz in Nov. Act. Ups. 6 (1799) 71.

The reflexed, twisted leaves (fig. 1c) of *D. trichocarpa* are typically linear-lanceolate and tapering to the long-apiculate to subacuminate apex. The suborbicular floral bracts (fig. 1d) are shortly acuminate and usually strongly recurved at the apex. The concave-cymbiform lip is subquadrate in outline (fig. 1b) with the lateral lobes small or obsolescent. The eligulate column (fig. 1a) is 2.5–3 mm. long, and the linear-oblong to elliptic or elliptic-oblanceolate petals are obtuse and apiculate to acute at the apex. The fragrant flowers are described by collectors as white with the lip barred and suffused with bluish purple.

This species is rare in Mexico, Guatemala and Costa Rica, but is widespread and rather common in the West

EXPLANATION OF THE ILLUSTRATION

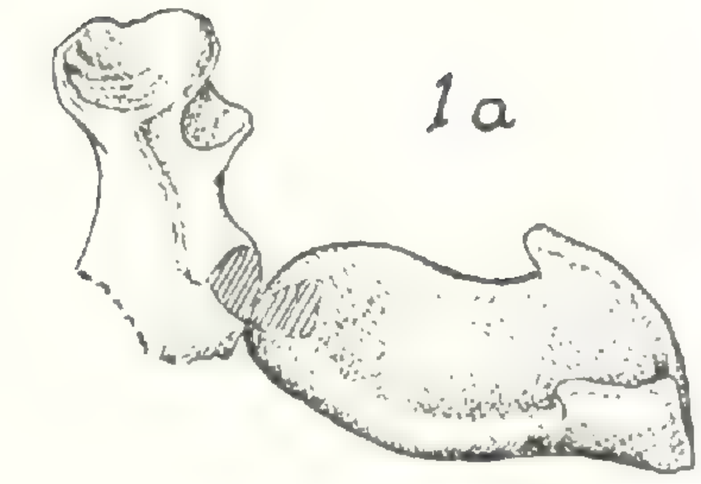
PLATE V. 1a–1d. DICHAEA TRICHOCARPA (*Sw.*) *Lindl.*
1a, lip and column, side view, five times natural size.
1b, lip spread out, front view, five times natural size.
1c, section of stem showing leaves, twice natural size.
1d, floral bract and bractlet, five times natural size.

2a–2b. ×DICHAEA INTERMEDIA *Ames & Correll.*
2a, lip and column, side view, five times natural size.
2b, lip, spread out, front view, five times natural size.

3a–3d. DICHAEA SQUARROSA *Lindl.*
3a, lip and column, side view, five times natural size.
3b, lip, spread out, front view, five times natural size.
3c, section of stem showing leaves, twice natural size.
3d, floral bract and bractlet, five times natural size.

Drawn by G. W. DILLON

Plate V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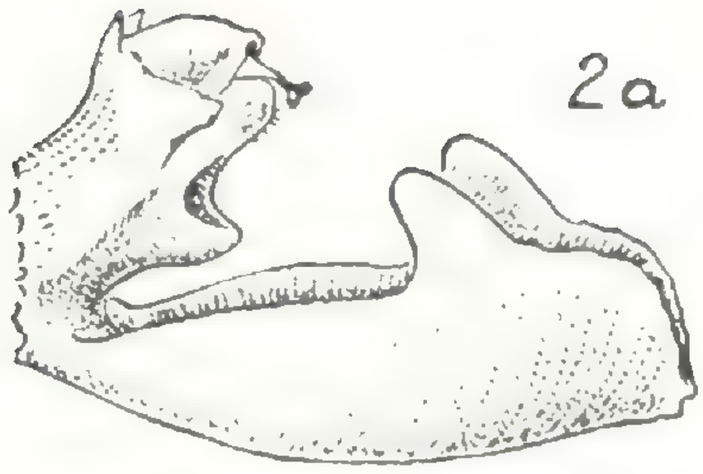
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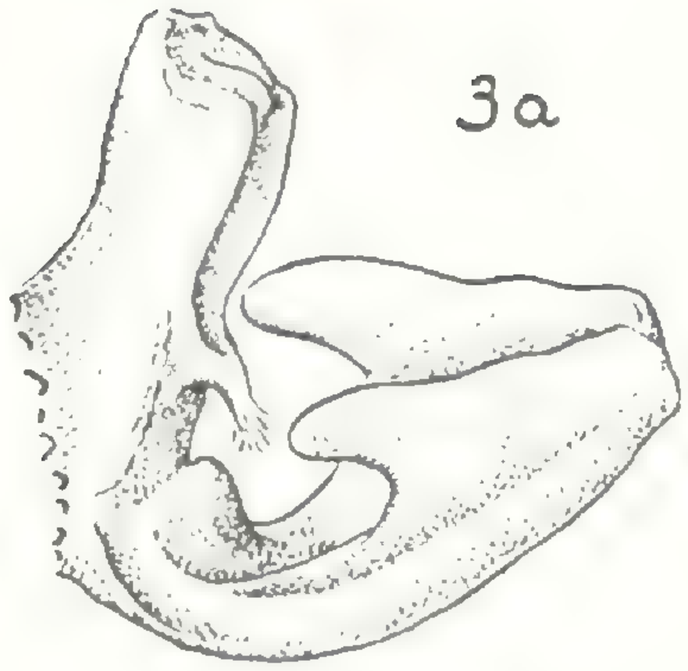
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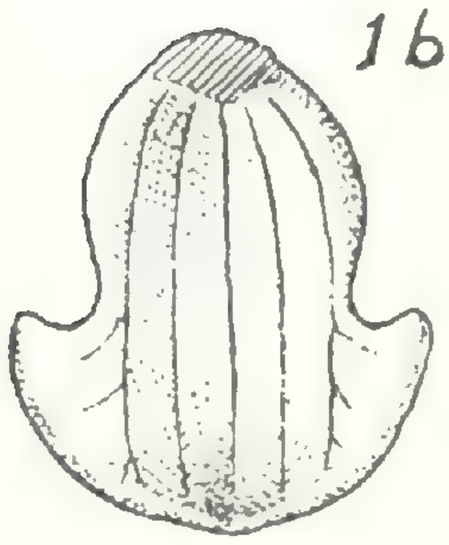
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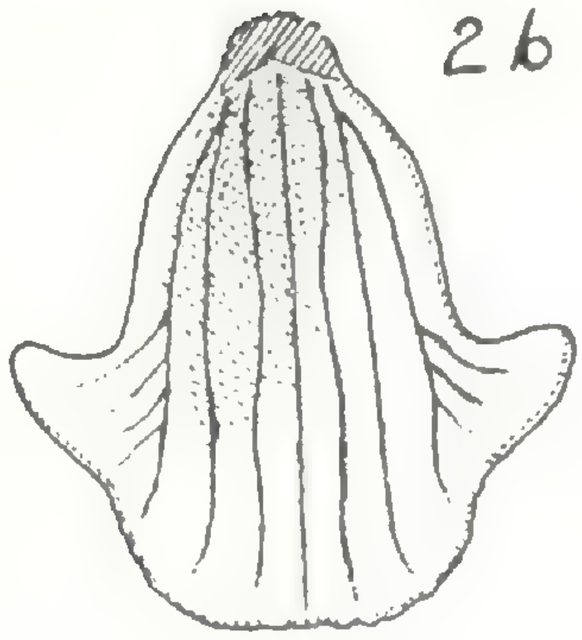
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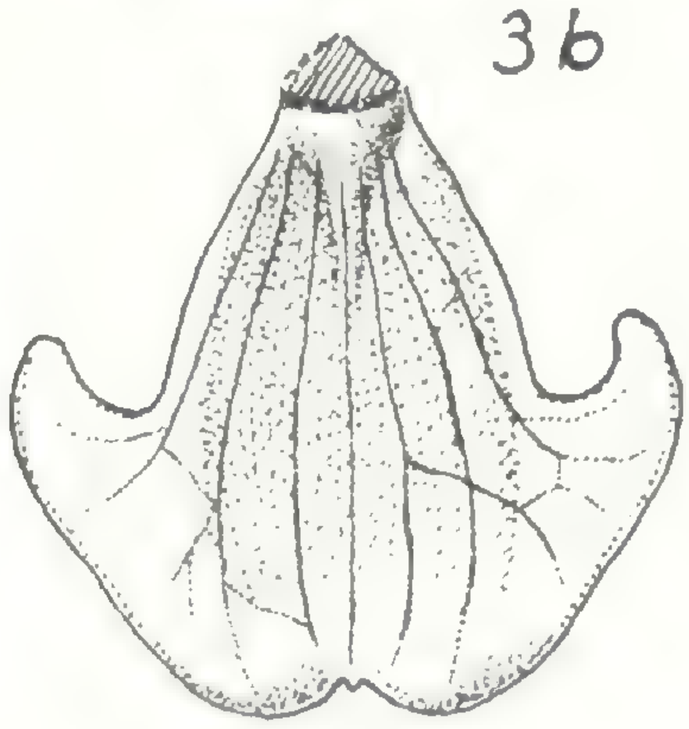
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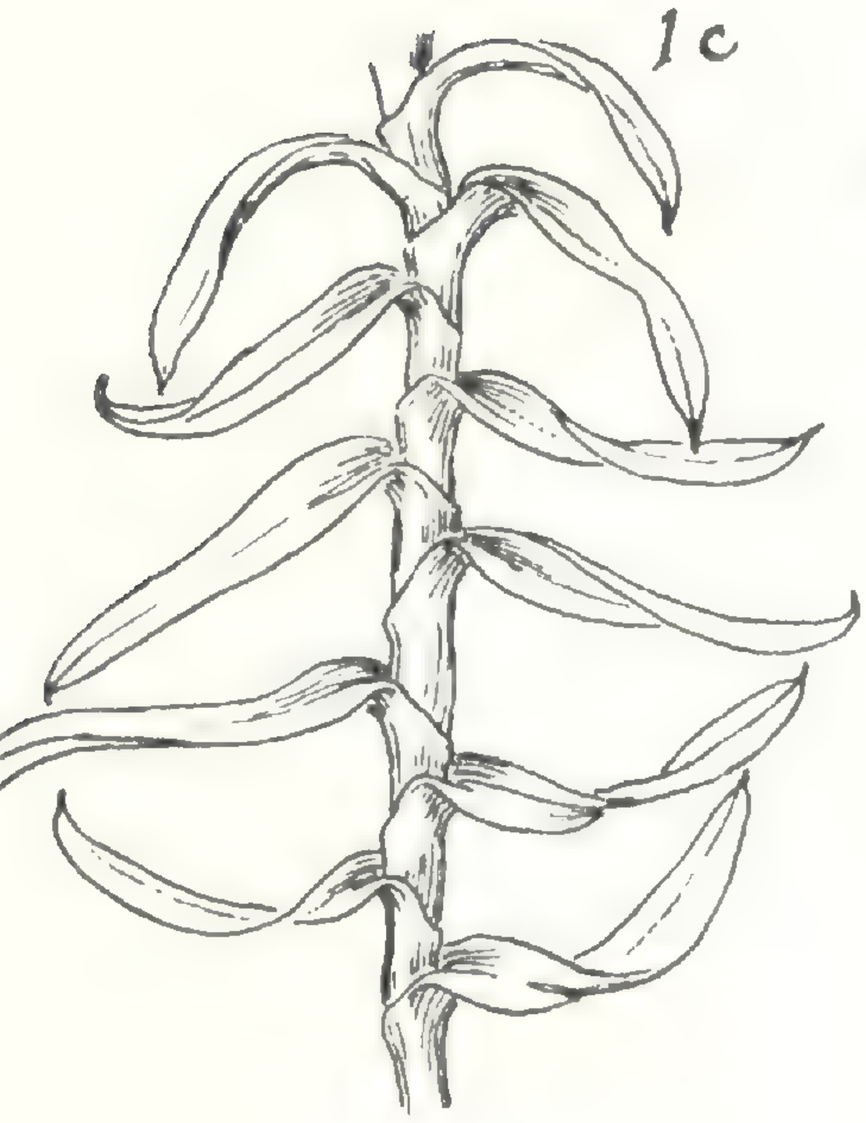
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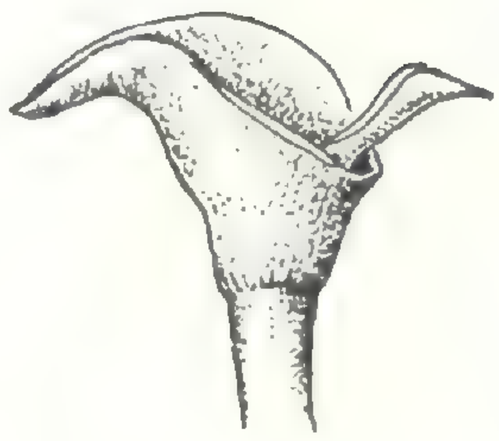
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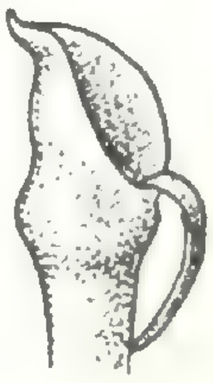
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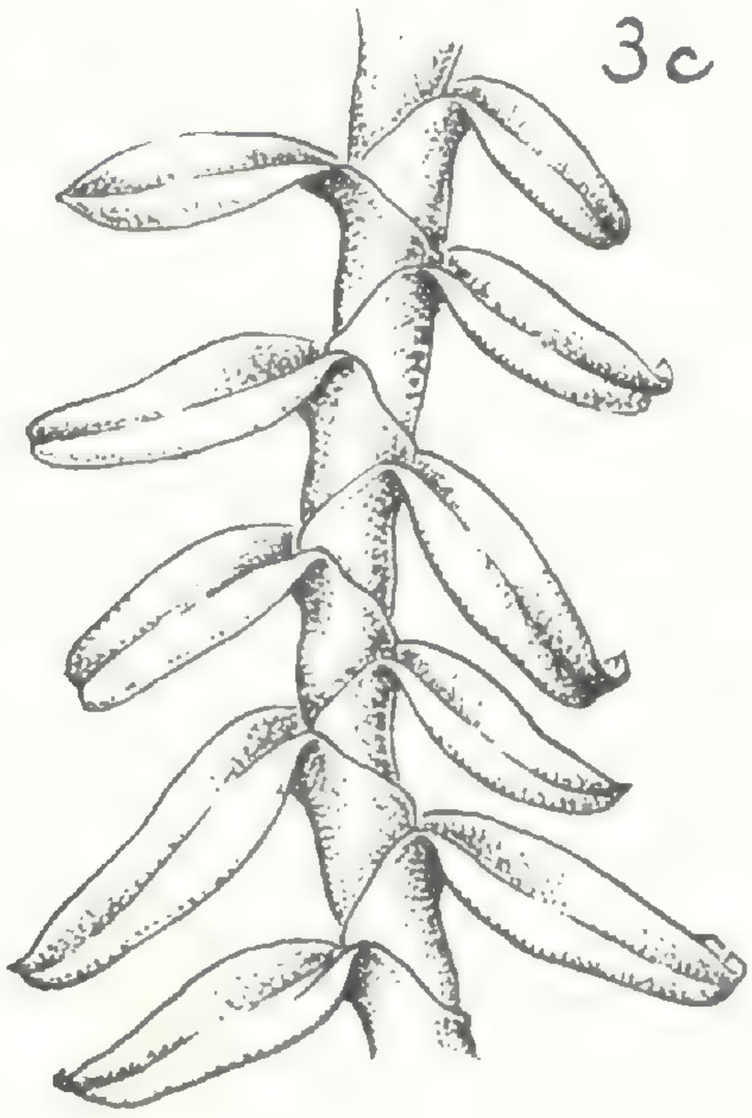
3c

Indies. It is found on trees and rocks in humid forests and on brushy banks usually at high elevations, up to 1850 meters altitude.

Mexico: Chiapas, Lake of Tziscao and Montebello, east of Comitan, *O. Nagel 5536* (Herb. Ames).

Guatemala: Alta Verapaz, Cobán, *H. von Tuerckheim 2450* (Herb. Ames); Alta Verapaz, near Tactic, above the bridge across Río Frío, *P. C. Standley 90473* (Herb. Ames, Herb. Field Mus.).

Costa Rica: Cartago, Carpintera, *C. H. Lankester 471* (Herb. Ames); Cartago, Cerro de la Carpintera, *P. C. Standley 34366* (Herb. Ames); Las Concavas, *C. H. Lankester 1006* (Herb. Ames); Tapanti, *M. Valerio 2622* (Herb. Ames); Cartago, Carpintera, *H. E. Stork 2244*, in part (Herb. Ames).

Cuba: Oriente, La Guineu, *C. Wright 1701* (Herb. Gray); Oriente, Sierra Maëstra, Pico Turquino, *E. L. Ekman 5281* (Herb. Gray); Oriente, High Maëstra, *Bro. Léon 10888* (Herb. Ames); Oriente, Maëstra ridge, *Bro. Léon 10717* (Herb. Ames); Santa Clara, Glen Ames, Mt. Harvard, Buenos Aires, Trinidad Hills, *J. G. Jack 8081* (Herb. Gray).

Jamaica: [Mabeis] River, *G. E. Nichols* (Herb. Gray); southwestern slopes of Mosman's Peak, along trail to "Main Ridge Gap," *W. R. Maxon 10101* (Herb. Ames); Tweedside, vicinity of Moody's Gap, *N. L. Britton 3405* (Herb. Ames); Abbey Green and vicinity, *W. R. Maxon 10054* (Herb. Ames).

Haiti: Vicinity of Furcy, *E. C. Leonard 4668* (Herb. Ames); Massif de la Telle, Nouvelle Touraine, Chapelle Faure, towards Morne La Visite, *E. L. Ekman 1481* (Herb. Ames).

Santo Domingo: Barahona, Polo, *W. L. Abbott 1860* (Herb. Ames, Herb. Gray); Constanza, *H. von Tuerckheim 3524* (Herb. Ames); Barahona, *P. Fuertes 876, 950B* (Herb. Ames); de la Vega, *M. Fuertes 1828* (Herb. Ames).

Dichaea squarrosa *Lindley* in Ann. & Mag. Nat. Hist. ser. 1, 4 (1840) 384.

Dichaea suaveolens Kränzlin in Engler Pflanzenr. IV. 50 (Heft 83) (1923) 39.

This species has in the past been included under *D. trichocarpa* (Sw.) Lindl., due in part to the existence of a natural hybrid, ×*D. intermedia* Ames & Correll, be-

tween *D. squarrosa* and *D. trichocarpa*. As shown by a photograph in the Ames Herbarium of Hartweg's specimen in the Lindley Herbarium, *D. squarrosa* is vegetatively characterized by its short, linear, obtuse and apiculate, strongly reflexed and usually twisted leaves (fig. 3c). The leaves of *D. trichocarpa* (fig. 1c) and ×*D. intermedia* are typically tapering to the long-apiculate to subacuminate apex. The suborbicular floral bracts of *D. squarrosa* (fig. 3d) are only shortly apiculate instead of being shortly acuminate and strongly recurved as in *D. trichocarpa* and in most specimens of ×*D. intermedia*. Florally, *D. squarrosa* has a longer column (4 mm. or more long) (fig. 3a) which is provided with a prominent pendent or projecting, hairy, ventrally placed ligule, whereas the column of *D. trichocarpa* (fig. 1a) and ×*D. intermedia* (fig. 2a) is 4 mm. or less long and is eligulate or has only a small erect glabrous or nearly glabrous ligule. The petals of *D. squarrosa* are cuneate and more or less truncate at the apex and the fleshy lip (fig. 3b) is cuneate-flabellate in outline, whereas the petals of *D. trichocarpa* and ×*D. intermedia* are obtuse and apiculate to acute, and the lower half of the lip is typically broadly rounded and concave.

Dichaea squarrosa, *D. trichocarpa* and ×*D. intermedia* comprise a closely allied group of plants. These concepts are easily distinguished from *D. muricata* and its variety *neglecta* (Schltr.) Kränzl. (with which they are sometimes confused) by their linear to linear-lanceolate, usually strongly reflexed leaves which are not at all decurrent on the leaf-sheaths. Furthermore the leaf-sheaths do not noticeably clasp the stem as in *D. muricata* and its variety *neglecta*. Instead, the lamina of the leaf is produced at the apex of the leaf-sheaths.

Dichaea squarrosa, on the basis of the specimens we have seen, is confined to Mexico, Guatemala, Salvador

and Costa Rica where it is found on trees in humid forests at high elevations, occasionally up to 2600 meters altitude. On the contrary, *D. trichocarpa* is widespread and rather common in the West Indies, with a few stations in Mexico, Guatemala and Costa Rica. ×*Dichaea intermedia* occurs only in Mexico and Guatemala, the northern limit of the area of distribution for both *D. squarrosa* and *D. trichocarpa*.

Lindley (in Ann. & Mag. Nat. Hist. ser. 3, 1 (1858) 333) reported *D. squarrosa* from Cuba, "Monte Verde; woods; on trees," collected by C. Wright. We have seen no material of this species from the West Indies. It is quite likely that this report was based on an erroneous determination of a specimen of *D. trichocarpa*.

Mexico: Mexico, near Temascaltepec, *G. B. Hinton 2703* (Herb. Ames); Mexico, near San Juan Atzingo, *O. Nagel & Juan G. 2699* (Herb. Ames); Mexico, Temascaltepec, La Labor, *G. B. Hinton 900* (Herb. Ames); Mexico, Temascaltepec, Rincon, *G. B. Hinton 15426* (Herb. Ames); Morelos, near Cuernavaca, *C. G. Pringle 7628* (Herb. Ames, Herb. Gray); Morelos, mts. N.W. of Cuernavaca, tow. Buenavista del monte and to Mexicapa, *O. Nagel & Juan G. 2701* (Herb. Ames); Morelos, south slope of Volcano Popocatepetl, *L. O. Williams 3866* (Herb. Ames); Guerrero, Galeana, Teotepec, *G. B. Hinton 14282* (Herb. Ames); Chiapas, Soconusco, Mt. Boguerón, *O. Nagel 4326* (Herb. Ames); Chiapas, Mt. Ovando, *E. Matuda 1811* (Herb. Ames).

Guatemala: Guatemala, Aguarce, *F. C. Lehmann 1642* (Photograph seen, type of *D. suaveolens* Kränzl.) (Herb. Ames); Guatemala, near Finca La Aurora, "Cienpies," *I. Aguilar 262* (sterile) (Herb. Field Mus.); Guatemala, slopes of Volcán de Pacaya, between San Francisco Sales and the base of the active cone, *P. C. Standley 80746, 80758* (both sterile) (Herb. Ames, Herb. Field Mus.); Guatemala, Volcán de Pacaya, above Las Calderas, *P. C. Standley 58500* (sterile) (Herb. Ames, Herb. Field Mus.); Guatemala, Volcán de Pacaya, *J. R. Johnston & John Porter* (comm. *M. W. Lewis 200*) (Herb. Ames); Jalapa, Potrero Carrillo, 13 miles northeast of Jalapa, *J. A. Steyermark 33112* (Herb. Ames. Herb. Field Mus.); Quezaltenango, Montaño Chicharro, on lower south-facing slopes of Volcán Santa Mariá, 2–4 miles south of Santa Mariá de Jesús, *J. A. Steyermark 34261* (Herb. Ames, Herb. Field Mus.); San Marcos, above Finca El Porvenir, between "Todos Santos Chiquitos" and "Loma de la Paloma," south-facing slopes of

Volcán Tajumulco, *J. A. Steyermark 37256* (sterile) (Herb. Ames, Herb. Field Mus.); also Volcán Zunil, *A. F. Skutch 943* (Herb. Ames).

Salvador: San Vicente, Volcán de San Vicente, *P. C. Standley 21569* (sterile) (Herb. Ames, Herb. Gray).

Costa Rica: Zarcero, *A. Smith H. 180* (sterile) (Herb. Ames); de Alajuela, vicinity of Fraijanes, *P. C. Standley & Rubén Torres R. 47555, 47608, 47611* (all sterile) (Herb. Ames).

III. The Status of Dichaea pendula

Dichaea pendula (*Aubl.*) *Cogniaux* in Urban Symb. Antill. 4 (1903) 182, *nom. conf.*

Limodorum pendulum Aublet Pl. Guian. Franc. (1775) 819, t. 322, *nom. conf.*

The sterile plant illustrated by Aublet is doubtless the same as *D. muricata*. However, the floral analysis is apparently a disproportionate drawing of the flower of a *Bletia*, the lip being only about one-third the size of the other floral segments. So far as we know, such a discrepancy in the size of the lip in respect to the other floral segments is not found in either *Dichaea* or *Bletia*. All of the floral segments of these genera are usually nearly equal in length. The slender-clavate, arcuate column illustrated by Aublet resembles that of a *Bletia*.

If it were possible to place *Limodorum pendulum* accurately it would doubtless be found to be conspecific, as to vegetative characters, with *D. muricata* (Sw.) Lindl. instead of being closely allied with the West Indian *D. echinocarpa*, to which it is usually referred. However, the confused plate and accompanying incongruous description of *Limodorum pendulum* necessitate its relegation to the status of *nomen confusum*.

The illustrations of *Dichaea pendula* by Cogniaux (in Martius Fl. Bras. 3, pt. 6 (1906) 486, t. 102, fig. 1) and by Schlechter and Hoehne (in An. das Mem. do Instituto de Butantan, Botan. 1, fasc. 2, 47, T. 11) are what we consider to be representative specimens of *D. muricata*.

HARVARD UNIVERSITY

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

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ORCHIDACEAE PERUVIANAE V

BY
CHARLES SCHWEINFURTH

THE FOLLOWING TREATISE, the fifth of the series describing novelties in the orchid flora of Peru, discusses eighteen new species and six new varieties.

Epidendrum aquaticoides *C. Schweinfurth sp. nov.*

Herba epiphytica, robusta. Caulis crassus, vaginis tubulatis imbricantibus omnino celatus. Folia numerosa, disticha, ovato-lanceolata vel ovato-oblonga, subacuta et mucronata, basi amplectentia, suberecta. Inflorescentia terminalis, paniculata, arcuato-flexuosa, cum ramulis leviter fractiflexis. Flores parvi, carnosi, aurantiaco-rubri. Sepalum dorsale elliptico-ovatum, subobtusum. Sepala lateralia late et oblique ovata, acuta. Petala linearia, obtusa, sepalo dorsali breviora. Labellum columnae valde adnatum; lamina concavo-conduplicata, simplex, perlate ovata, apice obtusa, basi profunde cordata; discus basi callis duobus parvis ornatus. Columna crassa, ad apicem dilatata, utrinque oblique auriculata.

Plant epiphytic, robust, up to 60 cm. or more high including the inflorescence. Stem stout, with two short ascending branches near the base, entirely concealed by tubular, striate, scabrous, imbricating sheaths which are leaf-bearing except at the base of the stem and branches. Leaves numerous, distichous, ovate-lanceolate or ovate-oblong, subacute and mucronate at the apex, clasping at

base, up to 8.8 cm. long and 2 cm. wide (often much smaller), coriaceous, rigidly suberect, more or less imbricating in the dried specimen. Inflorescence terminal, arcuate-flexuous, about 16 cm. long, paniculate with ascending few- to several-flowered branches; rachis more or less fractiflex. Floral bracts spreading, ovate, acuminate, concave, slightly shorter than the pedicellate ovary. Flowers small, rather loose, numerous, fleshy, orange-red. Dorsal sepal elliptic-ovate, subobtuse, about 8.2 mm. long and 5 mm. wide, 3-nerved. Lateral sepals obliquely and broadly ovate, acute, about 9.5 mm. long and 6 mm. wide, 3-nerved. Petals linear or oblanceolate-linear, obtuse, 1-nerved, about 7.8 mm. long. Lip adnate to the column nearly to its apex, slightly exceeding the lateral sepals; lamina concave-conduplicate and surrounding the apex of the column in natural position, simple, broadly ovate-cordate when expanded, deeply cordate at base, obtuse at apex, about 6.3 mm. long in the center and almost 10 mm. wide if forcibly expanded; disc with a pair of small fleshy complanate calli at base. Column stout, strongly dilated upward in front, terminating on each side in a very oblique transverse retuse auricle, about 5.2 mm. long at the back.

Epidendrum aquaticoides is very suggestive of the Brazilian *E. aquaticum* but differs in having a stout subsimple stem, numerous leaves, almost twice larger orange-red (instead of greenish or yellowish) flowers and the disc of the lip bicallose at base.

Cuzco: Prov. Urubamba, on trail from Puyupata to Sayacmarca, at 3600 meters altitude, August 5, 1942, *C. Vargas 2906* (Type in Herb. Ames No. 61883).

Epidendrum aquaticoides *C. Schweinfurth* var. **pusillum** *C. Schweinfurth var. nov.*

Herba satis ramosa, cauli graciliore, et foliis parvis

minute erosis et racemo paucifloro et sepalis quinquenerviis et labello crassiore a typo differt.

Plant apparently separable from the type by its slender branched stem (with branches ascending or suberect), by its small leaves (up to 2.3 cm. long and 6 mm. wide) with finely erose margins, by the small simply racemose few- (up to 6-) flowered inflorescences, by the distinctly 5-nerved sepals and by the more fleshy lip.

Cuzco: Prov. Urubamba, on trail from Puyupata to Sayacmarca, at 3600 meters altitude, epiphytic, flowers orange-red, August 5, 1942, *Vargas 2894* (Type in Herb. Ames No. 61885).

Epidendrum birostratum *C. Schweinfurth sp. nov.*

Herba epiphytica, basi lateraliter pauciramosa. Caulis vaginis tubulatis arctis supra foliiferis omnino celatus. Folia disticha, adscendentia, oblonga vel lineari-oblonga, subacuta, basi amplectentia. Inflorescentia terminalis, racemosa, pendula, laxius pluriflora. Flores satis parvi, carnosi, segmentis late patentibus. Sepalum dorsale elliptico-oblongum, acutum. Sepala lateralia ovato-lanceolata, longe mucronata, concava. Petala obovato-elliptica vel late spathulato-cuneata, subobtusa. Labellum columnae valde adnatum; lamina trilobata, basi cordata; lobi laterales oblique rotundato-dolabriformes; lobus medius porrectus, subquadratus, apice truncato tridentato. Columma brevis, crassa.

Plant epiphytic, over 56 cm. high (incomplete in my specimen). Roots fibrous, glabrous, stout, whitish, simple. Stems with a few strict short branches in the lower portion, entirely concealed by close, tubular, imbricating sheaths which become scarious and evanescent in the lower portion and are leaf-bearing above. Leaves numerous, distichous, ascending, oblong or linear-oblong, subacute with a caducous apicule, clasping at base, up to 12 cm. long and 1.3 cm. wide, subcoriaceous, with the margins minutely cartilaginous-crenulate. Inflorescence ter-

minal, nodding; pedumcle about 3.5 em. long, sheathed at base by two small imbricating spathes; raceme about 10 em. long. Floral bracts triangular-lanceolate or deltoid, acuminate, up to 5.5 mm. long. Flowers fourteen, loose, rather small, with widely spreading segments. Sepals fleshy. Dorsal sepal elliptic-oblong, acute with a dorsal conical mucro, up to 12.5 mm. long and 5.1 mm. wide. Lateral sepals ovate-lanceolate, concave, oblique, acute, with a long fleshy dorsally erose cusp, up to 18 mm. long and about 6 mm. wide. Petals obovate-elliptic or broadly spatulate-cuneate, subobtuse, up to 12 mm. long and 5.8 mm. wide, thinner than the sepals, minutely erose on the irregular margins, 3-nerved with the lateral nerves branching. Lip adnate to the column nearly to its apex, distinctly shorter than the lateral sepals, about 11 mm. wide across the lateral lobes when expanded; lateral lobes rounded-dolabriform, oblique, cordate at base, with the rounded outer margins minutely erose and the usually entire anterior margin nearly straight; mid-lobe porrect, subequal to the lateral lobes, subquadrate, slightly broader toward the apex, abruptly truncate in front, sinuately 3-dentate with narrow triangular teeth of which the middle tooth is slightly longer, fleshy-thickened and recurved; disc mostly occupied in the center by a large subquadrate-ovate depressed fleshy callus. Column very short and stout, adnate to the center of the lateral sepals up to about its middle, terminating in an oblique transverse auricle on each side, about 7.7 mm. long in the middle of the back.

Epidendrum birostratum recalls *E. Klotzscheanum* Reichb.f. vegetatively, but the awned lateral sepals and the sinuately tridentate mid-lobe of the lip appear to be unique.

Cuzco: Prov. Urubamba, Puyupata-Tuncapata, at 3200 meters altitude, epiphyte in wet forest, August 6, 1942, *C. Vargas 2927* (Type in Herb. Ames No. 61745).

Epidendrum blepharichilum *Kränzlin* var. **majus** *C. Schweinfurth var. nov.*

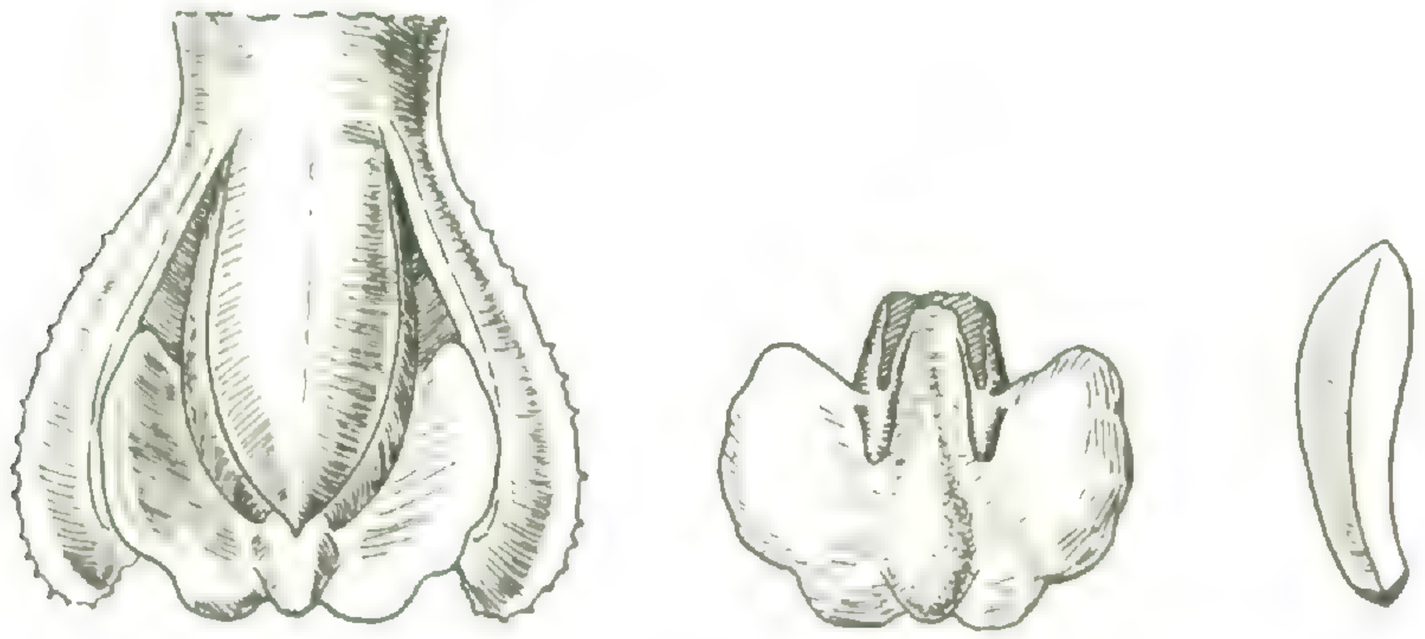
Herba habitu robustiore et foliis duplo latioribus et floribus duplo majoribus a specie differt.

Stems loosely branching, entirely concealed by long tubular sheaths which are scarious and without leaves in the lower portions but green and leaf-bearing above, up to 6 mm. in diameter across the sheaths. Leaves lanceolate-linear, 11–14 cm. long, 12–14 mm. wide, narrowed to an acute point. Inflorescence loosely paniculate with three strict branches issuing from elongate-infundibuliform spathes which are produced into linear foliaceous blades. Pediellate ovary spreading, up to 17 mm. long. Flowers rather fleshy. Dorsal sepal oblanceolate-elliptic, sharply acute, 14 mm. long, about 4.3 mm. wide above, 5-nerved. Lateral sepals obliquely elliptic-lanceolate, 15 mm. long and 4.6 mm. wide, 5-nerved, with a shortly acuminate fleshy apex. Petals oblanceolate-linear, acute, about 13 mm. long and 1.5 mm. wide, 1-nerved. Lip adnate to the column nearly to the apex; lamina replicate in natural position, deeply cordate at the base, suborbicular in outline, irregularly fringed throughout, retuse at the apex with a fleshy recurved apicule, about 13 mm. in greatest length and almost equally wide, slightly constricted (and thus trilobulate) above; disc biallose at base with the longitudinal central portion fleshy-thickened. Column strongly dilated above, very oblique at base, about 10 mm. long.

Apurimac: Prov. Abancay, Ampuy, at 3200 meters altitude, "epiphytic on an old Podocarpus . . . stems over 1 m; sepals and 2 slender petals reddish olivaceous, greener at the tips; the fringed lip light lavender rose; racemes pendent," February 12, 1939, *H. E. Stork, O. B. Horton & C. Vargas 10611* (Type in Herb. Field Mus. No. 1051131).—A collection of a fruiting plant intermediate in size between the species and the variety showing coarse fibrous roots bears the following data: Huánuco: Cani, seven miles northeast of Mito, at about 2600 meters altitude, April 16–26, 1923, *J. Francis Macbride 3461.*

Epidendrum capitellatum *C. Schweinfurth sp. nov.*

Herba mediocris, a basi radicanti ramosa. Caules patentes, foliosi, vaginis laxis infundibuliformibus maxima pro parte obtecti. Folia numerosa, disticha, late patentia, ovato-lanceolata vel oblongo-ovata, acuta, basi am-



Epidendrum capitellatum, flower from above, lip expanded and petal, three times natural size.

plectentia. Inflorescentia terminalis, breviter pedunculata; racemus subglobosus, dense multiflorus. Flores carnosissimi, parvi, rigidi. Sepalum dorsale oblongo-ovatum, acutum, profunde concavum. Sepala lateralia oblique ovata, acuta, carina prominenti plusminusve denticulata extus ornata. Petala lineari-oblanceolata, acuta vel subacuta. Labellum columnae valde adnatum; lamina concavo-conduplicata, extensa ovato-reniformis, apice truncato leviter retusa, super medium saepissime subtrilobata, basi cordata; discus basi bicallosus. Columna parva, crassa.

Plant rather small, with a branching rhizome. Roots fibrous, flexuous, glabrous. Stems spreading, leafy, up to 19 cm. tall to the inflorescence, mostly concealed by loose infundibuliform sheaths which are produced into leaf-blades. Leaves numerous, distichous, widely spreading, ovate-lanceolate or oblong-ovate, up to 5.1 cm. long and 1.6 cm. wide (the uppermost and lowermost blades smaller and ovate), acute, deeply clasping, with the margins cartilaginous-irregular to erose-crenulate near the apex, coriaceous. Pedunele short, provided with one or

two widely separated conduplicate recurved bracts which are up to 2.1 cm. long. Inflorescence terminal, capitate or subglobose, densely many-flowered, about 1.5 cm. long and broad. Flowers small, very fleshy, rigid, subglobose, green. Dorsal sepal oblong-ovate, acute, deeply concave, 7–8 mm. long, 3–3.7 mm. wide. Lateral sepals obliquely ovate, acute, concave, with a prominent more or less denticulate keel without, 7–8.5 mm. long, 4.5 mm. wide. Petals obliquely linear-oblanceolate, falcate, acute or subacute, 1-nerved, 6.1–7 mm. long and 2.2 mm. wide. Lip strongly adnate to the column; lamina concave-conduplicate in natural position, ovate-reniform in outline when forcibly expanded, deeply cordate at base, subtrilobed toward the apex, more or less retuse and apiculate at the truncate apex, 4.5–6 mm. long from a basal auricle to the apex, 6–7.6 mm. wide when expanded, with the rounded anterior sides lobulate or crenate; disc bicallose at base. Column very short and stout, 3.8–4.9 mm. long, truncate at the apex.

Epidendrum capitellatum seems to have no near allies. The specific name is in allusion to the capitate inflorescence.

HUANUCO: Cani, seven miles northeast of Mito, at about 2600 meters altitude, "in clumps in trees," April 16–26, 1923, *J. Francis Macbride 3463* (TYPE in Herb. Field Mus. No. 534538; ISOTYPE in Herb. Ames No. 61587).

Epidendrum carnosiflorum *C. Schweinfurth sp. nov.*

Herba epiphytica, irregulariter ramosa. Caules vaginis tubulatis omnino obtecti. Folia disticha, oblongo-linearia, minora, apiculata, basi sessili amplectentia, valde coriacea. Racemi ramorum apice terminales, saepissime arcuati vel nutantes, laxe pluriflori, rhachide leviter fractiflexa. Bracteae prominentes, late patentes, concavo-conduplicatae, late ovatae ut videtur. Flos carnosus. Sepalum dorsale

lanceolatum, acuminatum, concavum. Sepala lateralia oblique lanceolata, valde acuminata, concava vel navicularia. Petala linearia, a basi reflexa. Labellum columnae valde adnatum; lamina infra trilobata, basi cordato-truncata; lobi laterales parvi, erecti, semiobovati; lobus medius multo major, anguste triangularis, multo inerassatus, acuminatus. Columna parva, crassa.

Plant epiphytic, branching (incomplete in my specimen). Roots fibrous, glabrous. Stems irregularly branched, entirely enveloped by tubular-cylindric minutely rugose sheaths which are leaf-bearing except near the base, 5 mm. or less in diameter. Leaves distichous, oblong-linear, acute with an apiculate apex, slightly narrowed at the clasping base, up to 5.9 cm. long and 8 mm. wide, thickly coriaceous, with the mid-nerve prominently carinate beneath. Inflorescences terminal at the tip of the branches, racemose, suberect to nodding, about 9.5 cm. or less long, very loosely several- (up to 10-) flowered almost to the base, with the rachis more or less fractiflex. Floral bracts conspicuous, horizontally spreading, concave-conduplicate, ovate in outline, apiculate at the rounded to acute apex, up to 7 mm. long. Flowers fleshy (on the summit of rather mature ovaries in my specimen). Dorsal sepal lanceolate, acuminate to an acute apex, concave, about 10 mm. long and 3.5 mm. wide. Lateral sepals obliquely lanceolate or ovate-lanceolate, long-acuminate to an acute apex, concave below, navicular above, about 11 mm. long and 4.6 mm. wide. Petals linear, obtuse, abruptly reflexed at the base, lightly sigmoid, about 8.7 mm. long and 1 mm. wide, 1-nerved. Lip adnate to the column nearly to its apex; lamina tubular-involute, broadly cordate-truncate at the base, distinctly 3-lobed near the base, about 8.2 mm. long; lateral lobes erect and embracing the apex of the column, small, semiobovate with a somewhat flattened outer mar-

gin: mid-lobe much larger, narrowly triangular, acuminate to a subacute apex, very fleshy, concave below. Column very short and stout, about 3.3 mm. long at the back, extended on each side into a very oblique tooth.

Epidendrum carnosiflorum has apparently as its nearest ally the Central American *E. anoglossoides* A. & S., but differs in having laxer racemes, broader sepals, a sharply 3-lobed lip, etc. Its lip recalls that of *E. grammatoglossum* Reichb. f. and *E. Pavonianum* Reichb. f., but it is vegetatively very different from those species.

JUNIN: Pichis Trail, Eneñas, at 1700 meters altitude, epiphyte in open sphagnum swamp, July 1, 1929, *E. P. Killip & A. C. Smith 25705* (TYPE in U.S. Nat. Herb. No. 1359825).

Epidendrum elatum *C. Schweinfurth sp. nov.*

Herba magna, robusta, elata. Caulis crassus, cum ramis oppositifoliis, vaginis tubulari-cylindraceis omnino obtectus. Folia disticha, ovato- vel oblongo- vel elliptico-lanceolata, apice obtusa vel rotundata, basi amplectentia. Racemi terminales, arcuati vel nutantes, usque ad basim dense multiflori. Ovarium pedicellatum elongatum, bracteam lineari-lanceolatam multo superans. Flores mediocres, virides, carnosi. Sepalum dorsale oblanceolato-oblongum, obtusum, apice dorso inerassatum. Sepala lateralia obliquissime oblongo-oblanceolata, acuta, apice dorso multo inerassata. Petala oblique spathulato-linearia, obtusa vel truncata. Labellum columnae valde adnatum: lamina profunde trilobata; lobi laterales parvi, patentes, dolabriformes vel rotundato-ovati; lobus medius multo major, subquadrato-ovatus, apiculatus; discus basi bicallosus et lineis tribus antice ornatus. Columna generis.

Plant robust (lower part lacking in my specimen), 3 m. high according to the collector's notes. Stem stout, up to 1 cm. in diameter, with a short branch opposite each leaf, entirely concealed by tubular-cylindric minute-

ly rugose sheaths which are leaf-bearing except through the lower portion of the branches. Leaves distichous, ovate-, oblong- or elliptic-lanceolate, up to 16 cm. long and 4 cm. wide, obtuse to rounded at the (commonly incomplete) apex, clasping by a sessile base, chartaceous, the leaves on the lower portions of the branches much smaller. Racemes terminal, arcuate or nodding, densely many-flowered almost to the base, with the rachis up to 12 cm. long (incomplete in my specimen). Floral bracts linear-lanceolate, erect-spreading, much shorter than the elongate pedicelled ovary which is gradually dilated above and up to 4.9 cm. long. Flowers fleshy, green. Dorsal sepal oblanceolate-oblong, obtuse, 18–19.5 mm. long and 4.6 mm. wide, much thickened dorsally at the apex, 3- or indistinctly 5-nerved. Lateral sepals very obliquely oblong-oblanceolate, 18.8–21 mm. long, 5.7–6.5 mm. wide above, dorsally bluntly carinate-thickened and mucronate at the acute apex, 4- to 5-nerved. Petals obliquely spatulate-linear, obliquely truncate or obtuse at the apex, 17–19 mm. long, 3.7–4 mm. wide when expanded, with the upper margins minutely erose and revolute in natural position, 1-nerved throughout. Lip adnate to the column nearly to its apex; lamina sharply 3-lobed, deeply cordate at base, about 7.3 mm. long in the middle and 10 mm. wide across the lateral lobes; lateral lobes small, spreading, dolabriform or obliquely round-ovate with the exterior margin truncate or broadly rounded; mid-lobe much larger, subquadrate-ovate, bluntly apiculate, 5.2 mm. long and about equally wide; disc at base biallose and in front with three fleshy lines of which the middle one is longer and extends to the apex. Column about 15 mm. long, slightly dilated toward the apex.

Epidendrum elatum differs from *E. raphidophorum* Lindl. in lacking imbricating spathes subtending the inflorescence.

Ayacucho: Prov. Huanta, Choimacota Valley, at 3000 meters altitude, in "evergreen mountain forest," February 28–March 10, 1926, *A. Weberbauer 7536* (Type in Herb. Field Mus. No. 562446; Isotype in Herb. Ames No. 61558).

Epidendrum latisegmentum *C. Schweinfurth sp. nov.*

Herba magna, epiphytica, laxa. Caulis elongatus, arcuatus, ramis cum strictis, vaginis tubulatis evanidis omnino tectus. Folia in caulis parte superiore, elliptico-lanceolata, acuminata, pauca. Inflorescentia brevis, racemosa, pauciflora. Flores magni, flavo-virides. Sepalum dorsale ovali-obovatum, subacutum. Sepala lateralia oblique obovato-ovalia, acuta. Petala cuneato-spathulata, obtusa vel subacuta. Labellum columnae valde adnatum; lamina simplex, obovato-reniformis, carnosa, ommino dense cellulari-papillosa. Columna abbreviata, crassa, sursum dilatata. Pollinia quattuor, valde complanata.

Plant rather large, lax, epiphytic. Roots fibrous, stout, elongate, rigid. Stem elongate, arcuate, with scattering strict or appressed branches, apparently wholly concealed by close tubular sheaths which are scarious and evanescent below and leaf-bearing above. Leaves commonly confined to the upper part of the stems or branches, distichous, very loose below but approximate above, elliptic-lanceolate, spreading, acuminate, cuneate at the clasping base, up to 17 cm. long (apex incomplete in my specimen) and 3 cm. wide, the lower blades much smaller, apparently four in number, submembranaceous. Inflorescence terminal, racemose, apparently 5-flowered (broken in my specimen), subtended by a short acuminate conduplicate spathe which is about 13 mm. long. Flowers large, yellow-green. Dorsal sepal oval-obovate, about 19 mm. long and 13 mm. wide, subacute, 6-nerved (the lateral nerve branching on one side). Lateral sepals obliquely obovate-oval, acute, about 21 mm. long and 15 mm. wide, 7- to

8-nerved. Petals cuneate-spatulate, obtuse or subacute, about 19 mm. long and 11 mm. wide, 5-nerved. Lip adnate to the column nearly to its apex; lamina simple, obovate-reniform, fleshy, densely cellular-papillose on both surfaces, with the truncate anterior margin lightly retuse (more markedly so in the very center), about 16.5 mm. in greatest length and 25 mm. wide, remotely bicallose at base. Column abbreviated, very stout, dilated upward, semiorbicular-indented in the middle of the apex. Pollinia four, strongly complanate, obliquely semiglobose.

Epidendrum latisegmentum appears to lack South American allies. It recalls the Central American *E. Brenesii* Schltr., but differs in its longer leaves and larger flowers. In habit it recalls *E. jamaicense* Lindl., but has larger flowers, dissimilar petals and a densely papillose lip.

Loreto: Pumayacu, between Balsapuerto and Moyobamba, at 600 to 1200 meters altitude, epiphyte in forest, August–September 1933, *G. Klug 0.9* (Type in Herb. Ames No. 61550).

Epidendrum liguliferum *C. Schweinfurth sp. nov.*

Herba elata. Caulis laxus, plus minusve flexuosus, in parte superiore unico cum ramo, supra foliosus. Folia disticha, lanceolata vel elliptico-lanceolata vel oblongo-lanceolata, saepissime acuminata, amplectentia. Racemus terminalis, arcuatus, laxe pluriflorus, bracteis anguste lanceolatis conspicuis. Florum segmenta late patentia vel reflexa. Sepalum dorsale obovato-oblongum, acutum. Sepala lateralia oblique oblongo-obovata, acuta. Petala spathulato-linearia, obtusa. Labellum columnae valde adnatum; lamina expansa subquadrato-reniformis, apice truncato trilobulata; lobi laterales semiorbiculares; lobus medius transversus, oblongus vel reniformis; discus basi callis duobus ligulatis liberis ornatus. Columna generis.

Plant tall. Roots fibrous, flexuous, glabrous. Stem lax, more or less flexuous or fractiflex, often with a single

elongate branch above, leafy above, entirely or mostly concealed by tubular sheaths which are close scarious and evanescent below and leaf-bearing through the upper portion of the stem. Leaves distichous, lanceolate or elliptic-lanceolate (rarely oblong-lanceolate), up to 12.5 cm. long and 2 cm. wide (the lower blades much smaller), minutely erose at the acute or more often acuminate apex, sessile, amplexicaul, spreading, subcoriaceous. Raceme terminal, arcuate, loosely several-flowered (apparently incomplete in my specimen). Peduncle about 4.2 cm. long, mostly concealed by a slender tubular spathe with an oblong-lanceolate acute free portion. Floral bracts conspicuous, narrowly triangular-lanceolate, spreading. Flowers medium-sized, greenish white, with spreading or reflexed segments. Dorsal sepal obovate-oblong, acute, about 16.7 mm. long and 6 mm. wide, 5-nerved. Lateral sepals obliquely oblong-obovate, sharply acute, lightly carinate especially above, about 15 mm. long and 6 mm. wide. Petals spatulate-linear, obtuse, about 16 mm. long and 3 mm. wide, 3-nerved, with the upper margins minutely erose. Lip adnate to the column nearly to its apex; lamina convex in natural position, subquadrate-reniform when expanded, lightly cordate at base, shallowly but distinctly 3-lobed at the truncate apex, about 8.9 mm. long from the base to the tip of a protuberant side of the mid-lobe and 17.9 mm. wide; lateral lobes semiorbicular or rounded-dolabriform, with the outer margins irregular; mid-lobe transversely oblong or reniform, shallowly retuse, 1.2–2 mm. long and 6.4–8.2 mm. wide; disc at base with a pair of prominent spreading free ligulate calli which are about 4 mm. long and with a fleshy-thickened median line. Column conspicuous, abruptly dilated above in front, produced on each side into an obliquely subquadrate auricle, about 12 mm. in greatest length.

Epidendrum liguliferum is related to the Brazilian *E. Cooperianum* Batem., but has dissimilar leaves and form of lip. It differs from the Bolivian *E. Evelynae* Reichb. f. in having spatulate-linear (not linear) petals and in having elongate (not small and rounded) calli at the base of the lip. The flower is apparently similar to that of the Brazilian *E. Burgeri* Schltr.

HUANUCO: Cani, seven miles northeast of Mito, at about 2600 meters altitude, "floor of dense stream-wood," April 16–26, 1923, *J. Francis Macbride 3543* (TYPE in Herb. Field Mus. No. 534618; ISOTYPE in Herb. Ames No. 61554.

Epidendrum Macbridei *C. Schweinfurth sp. nov.*

Herba epiphytica, gracilis. Rhizoma abbreviatum. Caules approximati, plus minusve flexuosi, vaginis tubulatis vel infundibuliformibus tecti. Folia disticha, elliptico-lanceolata, acuminata, basi amplectentia, submembranacea. Inflorescentia terminalis, virgato-paniculata, laxe pluriflora. Flores parvi, segmentis patentibus. Sepala carnosa. Sepalum dorsale oblongo-oblanceolatum, subacutum, leviter concavum. Sepala lateralia oblique oblongo-oblanceolata, acuta et mucronata, leviter concava. Petala filiformia, sursum paulo dilatata. Labellum columnae valde adnatum; lamina flabellato-subquadrata, basi cordata, antice trilobata; lobi laterales oblique ovato-dolabriformes; lobus medius a basi cuneata transverse oblongus, antice late truncatus, medio apiculatus, haud exsertus. Columna supra dilatata, utrinque in auriculas bidentatas extensa.

Plant epiphytic, slender, about 29 cm. or less in height. Roots fibrous, flexuous, glabrous. Rhizome abbreviated, creeping. Stems approximate, spreading, more or less flexuous, entirely invested by infundibuliform or tubular sheaths which are evanescent (and often absent) below and leaf-bearing above, about 20.5 cm. or less long. Leaves distichous, spreading, elliptic-lanceolate (rarely

elliptic-linear), acuminate, cuneate at the clasping base, up to 10.3 cm. long and 1.75 cm. wide, (the uppermost and lower blades much smaller), ten or less, submembranaceous. Inflorescence a short virgate few-branched panicle which is sheathed at the base and surpassed by the leaves, with branches very loosely 7-flowered or less. Flowers small, with spreading segments, greenish white. Sepals fleshy. Dorsal sepal oblong-oblanceolate, about 8.5 mm. long and 3 mm. wide, subacute, 4- to 5-nerved, lightly concave. Lateral sepals obliquely oblong-oblanceolate, acute with a dorsal mucro, 5-nerved, about 9 mm. long and 3.1 mm. wide, lightly concave. Petals filiform, slightly broader toward the apex, obtuse or subacute, about 8 mm. long and 0.75 mm. wide, 1-nerved. Lip adnate to the column nearly to its apex; lamina flabellate-subquadrate in outline, cordate at base, 3-lobed in front, about 3 mm. in greatest length and 5 mm. across the lateral lobes; lateral lobes obliquely ovate-dolabriform, spreading, with the outer margins lightly emarginate below the middle; mid-lobe smaller than the lateral lobes and not exceeding them in front, transversely oblong from a cuneate base, broadly truncate at the apex with a small triangular apicule in the middle; disc adorned throughout the center with a large oblong-ovate fleshy callus which is acute, lightly 3-lobulate and bisulcate with furrows converging toward the base. Column dilated above in front, extended on each side into a subquadrate bilobed auricle, about 4 mm. long on the posterior surface and 6 mm. long in front to the apex of an auricle. Pollinia four, compressed, the outer pair semilunate in outline, the inner pair obliquely slender-pyriform.

Epidendrum Macbridei seems closely similar to *E. parviflorum* Ruiz & Pav., but differs in having much larger flowers and a dissimilar lip.

HUANUCO: Pampayaco (Pampayacu), Hacienda at mouth of Río

Chinchao, at about 1070 meters altitude, July 19–25, 1923, *J. Francis Macbride 5081* (Type in Herb. Field Mus. No. 536128; Isotype in Herb. Ames No. 61588).

Epidendrum magnicallosum *C. Schweinfurth sp. nov.*

Herba saepe elata et gracilis. Rhizoma abbreviatum. Caules approximati, a basi gracili sensim leviter dilatati, apice unifoliati. Folium strictum, lanceolato-lineare, acuminatum, coriaceum, rigidum. Inflorescentia elongata, gracilis, ramis remotis brevibus supra praedita. Flos parvus. Sepalum dorsale ovato-ovale. Sepala lateralia similia, obliqua. Petala cuneato-obovata. Labellum columnae valde adnatum: lamina simplex, suborbiculari-obovata, antice late rotundata; discus callo magno quinquelobato acuto praeditus. Columna perbrevis. Ovarium apice cum vesicula.

Plant epiphytic, apparently very variable vegetatively. Rhizome creeping, abbreviated. Roots fibrous, flexuous, numerous. Stems approximate, up to 16.3 cm. high, monophyllous at the apex, from a slender base gradually slightly dilated above, several-jointed, entirely concealed by several close imbricating tubular sheaths which are evanescent in anthesis, tuberous-thickened at the very base. Leaf lanceolate-linear, acuminate, narrowed to a clasping base, about 20.5 cm. or less long (incomplete in my specimen), up to 1.2 cm. wide, coriaceous, rigidly subereet. Inflorescence terminal, slender, elongate, entirely clothed by close tubular evanescent sheaths, up to 30.4 cm. long (incomplete in my specimen), remotely provided with several short strict few-flowered branches or clusters of branches on the upper portion, as in *E. anceps* Jacq. Flower small, cream-colored, rather fleshy. Dorsal sepal ovate-oval, abruptly acute, about 7.5 mm. long and 5 mm. wide, 6- to 7-nerved. Lateral sepals similar, obliquely ovate-oval, acute, dorsally carinate

above, about 6.9 mm. long and 4.8 mm. wide, 9-nerved at the base. Petals cuneate-obovate, rounded or subacute at the apex, about 6.9 mm. long and 3.8 mm. wide above, 1-nerved or indistinctly 3-nerved. Lip adnate to the column nearly to its apex; lamina simple, suborbicular-obovate, minutely retuse and apiculate at the broadly rounded apex, about 5.4 mm. in greatest length and 5.9 mm. wide above, the disc being mostly occupied by a large acute subquadrate-ovate 5-lobed concave callus. Column stout, abbreviated, about 2 mm. long. Ovary with a small subglobose vesicle at its summit at the junction with the lateral sepals.

Another collection, *G. Klug 984*, consists of three small plants which are very dissimilar in appearance but the solitary flower examined is nearly identical with that of typical *E. magnicallosum*. Its characters are as follows. Plant up to 9.8 cm. high. Stem up to 2 cm. high, similarly dilated upward and invested by close sheaths. Leaf solitary, apical, linear-lanceolate, up to 7.9 cm. long and 6 mm. wide, acuminate. Inflorescence abbreviated, few-flowered, incomplete in my specimen. Flower white and lilac. Dorsal sepal ovate-oval, subacute, about 8.5 mm. long and 5 mm. wide. Lateral sepals similar, strongly connate almost to the middle, about 7.5 mm. long and 4.5 mm. wide. Petals cuneate-spatulate, abruptly acute, about 7.5 mm. long and 3.9 mm. wide above. Lamina of lip suborbicular-obovate, about 5.8 mm. long and 5.6 mm. wide, minutely apiculate at the broadly rounded apex, with a similar large 5-lobulate callus. Column about 2 mm. long. Vesicle on ovary more prominent than in the type.

There appear to be no close allies to this species. *Epidendrum Aloisii* Schltr., while very dissimilar vegetatively, has a somewhat similar lip.

Loreto: Vicinity of Iquitos, at 100 meters altitude, epiphyte, flow-

ers cream-colored, July 1937, *G. Klug 10117* (Type in Herb. Ames No. 61552); Mishuyacu, near Iquitos, at 100 meters altitude, in forest, flowers white and lilac, February–March 1930, *Klug 984*.

Epidendrum microtos *Reichenbach filius* var. **grandiflorum** *C. Schweinfurth var. nov.*

Herba pseudobulbosa, foliis angustissime linearibus, floribus satis majoribus et petalis minus spathulatis subacutis et labelli lobo medio emarginato a specie differt.

Plant epiphytic, variable vegetatively. Pseudobulbs ovoid, concealed and surpassed by the fibres of evanescent sheaths, up to 5.2 cm. high, two- to three-leaved at the summit. Leaves very narrowly linear, up to 30 cm. long and 7.5 mm. wide, acute, rigidly coriaceous, often conduplicate in the dried specimen. Inflorescence either racemose or loosely paniculate, subequaling or shorter than the leaves, with the branches of the peduncle and the pedicellate ovary densely scabrous or verruculose. Flowers medium-sized, with spreading segments, rather fleshy, dark rose or carmine. Dorsal sepal oblong-oblanceolate, obtuse or subacute, about 1.7 cm. long and 5.5 mm. wide. Lateral sepals similar, obliquely oblanceolate-oblong, subacute, up to 1.9 cm. long and 6.5 mm. wide. Petals oblanceolate to subspatulate, subacute, about 1.65 cm. long, 5–6 mm. wide. Lip nearly free from the column; lamina cuneate at base, emarginate at the apex, sharply 3-lobed; lateral lobes triangular-oblong, lightly retrorse, rather obtuse, with rounded angle in the middle of the posterior margin; mid-lobe much larger, obovate-subrotund with strongly recurved sides and slightly undulate margins; disc with a broad flattened basal thickening which extends into three thickened lines, with nerves densely minute-papillose. Column short, stout, lightly recurved on the back, irregularly crenate-dentate at the apex, with a pair of small angulate or auriculate appendages in front near the apex, about 7.3 mm. long.

This concept is based upon two recent collections of complete plants which appear to be referable to *E. microtos* Reichb. f. (described only from an inflorescence lacking any vegetative parts), except for the somewhat larger flowers with less distinctly spatulate more acute petals and an emarginate lip.

JUNIN: Chanchamayo Valley, at 1600 meters altitude, September, 1929, *Carlos Schunke 1114*.—LORETO: Upper Marañon River at mouth of the Santiago River, at 160 meters altitude, in rain-forest, October 15, 1924, *G. Tessmann 4301* (TYPE in Herb. Hort. Berol.).

Epidendrum minutidentatum *C. Schweinfurth sp. nov.*

Herba mediocris, supra divaricato-ramosa. Caules vaginis laxis celati. Folia numerosa, oblonga vel elliptico-oblonga vel ovato-oblonga, obtusa et mucronata, late patentia. Inflorescentia abbreviata, subumbellata, uni-vel triflora. Flores parvi, longe pedicellati. Sepalum dorsale oblongo-ovatum, subacutum. Sepala lateralia oblique oblongo-ovata, acuta et mucronata. Petala elliptico-oblonga vel rhombico-lanceolata, obliqua, obtusa. Labellum columnae valde adnatum; lamina concava, suborbiculari-ovata, leviter retusa, basi profunde cordata, marginibus conspicue denticulatis. Columna brevis, crassa, more generis.

Plant medium-sized, about 24 cm. or less tall. Roots fibrous, flexuous, glabrous. Stems slender, divaricately branched above, entirely or mostly concealed by loose tubular-infundibuliform sheaths which are chiefly leaf-bearing but become scarious evanescent and without blades in the lower portion of the stem and branches. Leaves small, numerous, distichous, either oblong or ovate-oblong or elliptic-oblong, apiculate at the obtuse or rounded apex, clasping at the sessile base, widely spreading, up to 3.8 cm. long and 1.25 cm. wide, minutely denticulate especially near the apex. Inflorescence a ter-

minal, subumbellate raceme, 1- to 3-flowered, the abbreviated pedumele being concealed by one (rarely two) broad spathes which are strongly conduplicate and apiculate. Pedicellate ovary slender, fusiform above, 2–2.2 cm. long. Flowers rather small, reddish brown. Sepals 3-nerved, thickened toward the apex. Dorsal sepal oblong-ovate, subacute, about 10 mm. long, 5–5.3 mm. wide, with the margins (except near the apex and base) denticulate-erose. Lateral sepals obliquely oblong-ovate, sharply acute and mucronate, about 10 mm. long, 5–5.3 mm. wide, with the dorsal margin (except near the base and apex) denticulate-erose. Petals obliquely elliptic-oblong or rhombic-lanceolate, about 8.8 mm. long and 3.7 mm. wide, obtuse, 3-nerved, with the upper margins denticulate-erose. Lip adnate to the column nearly to its apex; lamina deeply concave, simple, suborbicular-ovate or quadrate-ovate, lightly retuse at the apex, with the margins (except at the deeply cordate base) conspicuously denticulate, about 10 mm. long in greatest length and 10.2 mm. wide when forcibly expanded, with a pair of prominent complanate calli at the base. Column short and stout, dilated upward, produced on each side into a transversely subquadrate auricle, about 5.2 mm. long.

Epidendrum minutidentatum appears to be allied to the Colombian *E. viridibrunneum* Reichb. f., but its habit appears to be subereet and not creeping, the leaves not linear and acuminate and the petals not linear.

Cuzco: Prov. Quispicanchi, Marcapata, at 3100 meters altitude, "bushwood consisting of high shrubs and small trees, with many hard-leafed types," February 15-16, 1929, *A. Weberbauer 7804* (Type in Herb. Field Mus. No. 605154; Isotype in Herb. Ames No. 61551).

Epidendrum minutiflorum *C. Schweinfurth sp. nov.*

Herba pusilla, epiphytica, arcuata. Caulis arcuatus, brevibus cum ramis, vaginis tubulatis evanidis omnino

obtectus. Folia pauca, filiformia, subteretia. Inflorescentiae terminales, racemosae, laxe pluriflorae. Flores perparvi, subglobosi, carnosi. Sepalum dorsale ovatum, mucronatum. Sepala lateralia oblique lateque ovata, valde acuta et mucronata, dorso carinata. Petala linearia, acuta, supra paulo latiora. Labellum columnae valde adnatum; lamina parva, ovato-cordata, subacuta, conspicue bicallosa. Columna pro flore magna et crassa, apice utrinque subquadrato-auriculata.

Plant small, slender, epiphytic, arcuate. Roots fibrous, filiform, flexuous, elongate. Stems slender, about 25 cm. or less long including the raceme, provided with numerous short branches, wholly concealed (as are the branches) by close tubular evanescent sheaths which are leaf-bearing on the upper part of the branches, the main stem often with short adventitious roots at the junction of the branches. Leaves one to four to a branch, distichous, subterete, filiform, up to 5.3 cm. long, abruptly acute or apiculate, ascending or spreading. Inflorescence a terminal raceme about 4.5 cm. or less long, with the peduncle more or less concealed by a slender conduplicate scarious spathe. Raceme rather short, loose, up to 11-flowered. Flowers very small, little open, subglobose-ellipsoid, greenish white. Sepals fleshy, concave, 3-nerved. Dorsal sepal ovate, about 3.5 mm. long and 2.2 mm. wide, acute with a dorsal mucro. Lateral sepals slightly larger than the dorsal sepal, obliquely broad-ovate, sharply acute and mucronate, dorsally carinate, shortly connate below, about 3.8 mm. long and 2.2 mm. wide. Petals linear, acute, 1-nerved, about 3 mm. long and 0.5 mm. wide above the middle, slightly dilated at the base. Lip adnate to the column nearly to its apex; lamina small, cordate-ovate, fleshy, concave, subacute, about 1.9 mm. long from a basal auricle to the apex and nearly as wide across the base; disc at base with a pair of relatively large fleshy

approximate calli. Column large and stout for the flower, extended into a transversely subquadrate auricle on each side, about 2.7 mm. long from the base to the apex of a lateral auricle. Anther flattened-hemispherical, 4-celled.

Epidendrum minutiflorum has three apparent allies. *E. Schlimii* Reichb.f. has shorter leaves, looser fractiflex racemes and a dissimilar lip. *E. Rolfeanum* Lehm. & Kränzl. has larger and less fleshy flowers and a different lip. *E. physophorum* Schltr. has a paniculate inflorescence and a dissimilar lip.

CAJAMARCA: Prov. Cutervo, "10 km. northwest of Socota, ceja de la montaña," at 3200 meters altitude, epiphytic, December 10, 1938, *H. E. Stork & O. B. Horton 10140* (TYPE in Herb. Field Mus. No. 1051150).

Epidendrum nanum *C. Schweinfurth sp. nov.*

Herba nana, saepissime valde divaricato-ramosa. Caules graciles, ramosi, patentes, vaginis tubulatis brevibus infra evanidis supra persistentibus et imbricantibus tecti. Folia disticha, late patentia, linearia, obtusa, minute apiculata. Inflorescentia terminalis, abbreviata, saepissime biflora. Flores parvi. Sepalum dorsale anguste lanceolatum, acutum vel acuminatum. Sepala lateralia oblique lineari-lanceolata, acuminata, dorso conspicue carinata. Petala oblique linearia, acuta. Labellum columnae valde adnatum; lamina profunde trilobata, basi leviter cordata; lobi laterales aliformes, semiovati; lobus medius porrectus, lanceolatus vel lineari-lanceolatus, acuminatus; discus basi minute bicallosus. Columna brevis, apice denticulata, utrinque conspicue unidentata.

Plant dwarf, commonly divaricately branched, in habit similar to *Epidendrum Porpax* Reichb. f. (in Bonplandia 3 (1855) 220). Roots fibrous, filiform, more or less branched, glabrous. Stems slender, usually much branched, spreading, entirely concealed by short loose tubular or infundibuliform sheaths which are commonly

evanescent below and persistent imbricating and leaf-bearing above. Leaves horizontally spreading, distichous, linear, fleshy, obtuse and minutely apiculate with a dorsal denticulate mucro, clasping at base, commonly up to 17 mm. long and 2 mm. wide, rarely as much as 28 mm. long and 3.7 mm. wide (these measurements obtained by soaking the blade in hot water), with the mid-nerve carinate beneath especially toward the apex. Inflorescence terminal, abbreviated, apparently sessile, commonly 2-flowered with each flower in the axil of a conspicuous conduplicate carinate bract. Flowers small but large for the plant, with spreading segments. Dorsal sepal narrowly lanceolate or oblong-lanceolate, about 9.5 mm. long and 2.2 mm. wide, acute or acuminate, 3-nerved, dorsally indistinctly carinate. Lateral sepals obliquely linear-lanceolate, up to 11 mm. long and 2.2 mm. wide, acuminate, 3-nerved, dorsally prominently carinate. Petals obliquely linear, up to 9.1 mm. long and 1 mm. wide in the middle, acute, 3-nerved. Lip adnate to the column nearly to its apex; lamina deeply 3-lobed near the shallowly cordate base, up to 7.9 mm. long in the middle; lateral lobes aliform, semiovate, narrowed to an obtuse apex, about 3.4 mm. long and 1.6 mm. wide below, suberect in natural position; mid-lobe much larger, porrect, lanceolate or linear-lanceolate, up to 6.4 mm. long and 2.1 mm. wide, acuminate to an obtuse apex, 5-nerved at base; disc with a pair of dentiform calli at the base. Column short, stout, dilated upward, up to 4 mm. long at the back, denticulate at the apex, on each side with an obliquely triangular porrect tooth.

Epidendrum nanum appears to lack close allies. In habit it resembles *E. Porpax* Reichb.f.

The collection, *Schunke 552*, consists of a single plant with simple stem and rather larger leaves and flowers than in the type collection.

JUNIN: Chanchamayo Valley, at 1800 meters altitude, November "1924-1927," *Carlos Schunke 544* (TYPE in Herb. Field Mus. No. 571602; ISOTYPE in Herb. Ames No. 61608); same locality and altitude, October "1924-1927," *Schunke 522;* Schunke Hacienda, above San Ramón, at 1300-1700 meters altitude, in dense forest, *Schunke 455.*

Epidendrum orbiculatum *C. Schweinfurth sp. nov.*

Herba robusta sed humilis. Caulis vaginis laxis infundibuliformibus celatus. Folia disticha, late patentia, pauca, elliptico-oblonga vel ovalia (rarenter oblongo-lanceolata), infima multo minora. Inflorescentia laxe pauciflora, spatha magna conduplicata subtenta. Flores grandes. Sepalum dorsale ovato-ellipticum, late obtusum. Sepala lateralia oblique oblongo-ovata, obtusa vel subacuta, navicularia, dorso carinata. Petala linearia, obtusa. Labellum columnae valde adnatum; lamina simplex, suborbicularis, apice valde emarginata, basi distanter et breviter bicarinata. Pollinia generis.

Plant low and stout, up to 25 cm. tall (lower part of stem incomplete in my specimen). Stem simple or with a single abbreviated branch below, straight or arcuate, entirely or nearly concealed by loose infundibuliform sheaths which are leaf-bearing except near the base, with the lower portion producing a few elongate fibrous roots which often bear small ellipsoid swellings. Leaves distichous, widely spreading, four to each stem, elliptic-oblong to oval or rarely oblong-lanceolate, up to 7.3 cm. long and 3 cm. wide (the lower blades much smaller), bilobulate at the rounded or obtuse apex, sessile at the clasping base, chartaceous in the dried specimen. Inflorescences terminal, few- (3- to 5-) flowered, very loosely racemose, subtended by a stout conduplicate spathe which is up to 3.5 cm. long and about 1.5 cm. wide and which entirely conceals the short pedunele. Flowers large, long- and slender-pedicelled, greenish or greenish brown. Dorsal

sepal ovate-elliptic, obtuse with a minute dorsal mucro, concave, 5-nerved, about 15 mm. long and 9.5 mm. wide. Lateral sepals obliquely oblong-ovate, obtuse or subacute, navicular, dorsally carinate, 5-nerved, about 17 mm. long and 10 mm. wide. Petals linear, about 16 mm. long and 1 mm. wide, obtuse, prominently 1-nerved or indistinctly 3-nerved. Lip adnate to the column nearly to its apex; lamina simple, suborbicular, conspicuously emarginate, about 22 mm. long (at the longest part) and 26 mm. wide, broadly cuneate at the base, with a pair of short widely separated fleshy keels below. Column very short and stout, broadly conical when viewed from the side, about 9 mm. long measured on the dorsal surface. Pollinia four, strongly complanate, obliquely ellipsoid.

Epidendrum orbiculatum is allied to *E. Scutella* Lindl., but has much narrower petals and prominently retuse lip.

Cuzco: Prov. Calca, Lares Valley above Mantoc, at 2400-2500 meters altitude, on rocks, flowers greenish or greenish brown, March 8, 1929, *A. Weberbauer 7904* (Type in Herb. Field Mus. No. 605234; Isotype in Herb. Ames No. 61545).

Epidendrum paniculatum *Ruiz & Pav.* var. **linearifolium** (*Cogn.*) *C. Schweinfurth comb. nov.*

Epidendrum parviflorum Ruiz & Pavon Syst. Veg. (1798) 245.

Epidendrum gratiosum Reichenbach filius in Bonpl. 4 (1856) 215—Cogniaux in Mart. Fl. Bras. 3, pt. 5 (1898) 165.

Epidendrum gratiosum Reichb.f. var. *linearifolium* Cogniaux in Mart. Fl. Bras. 3, pt. 5 (1898) 166.

Epidendrum patulipetalum Schlechter in Fedde Repert. Beihefte 9 (1921) 91; ex Mansfeld in Beihefte 57 (1929) t. 120, nr. 472.

An examination of what is undoubtedly isotype material of *Epidendrum parviflorum* from the Madrid Herbarium shows that this concept cannot reasonably be

separated specifically from the extremely variable *E. paniculatum*. Although *E. parviflorum* is a smaller and more delicate plant than the usual form of *E. paniculatum*, there does not appear to be any striking morphological character—either vegetative or floral—to separate it from that species. The flowers of *E. parviflorum*, however, are much smaller than those of any of the *E. paniculatum* examined or recorded, and accordingly it seems reasonable to recognize this weak and small-flowered plant as a named variety of *E. paniculatum*. Its sepals are 5 mm. long, whereas those of *E. paniculatum* range from 8.2–16 mm. in length. In addition, the variety has the base of the lip provided with a small trilobulate plate, whereas in *E. paniculatum* there are two calli which are either separate or joined. Although typically found in Peru, this small-flowered form occurs also in Ecuador.

Epidendrum gratiosum, of which I have seen a photograph and a drawing from the type specimen in the Reichenbach Herbarium, appears to be an exact counterpart of *E. parviflorum* and was described from Ruiz & Pavon material. The flowers, as described, also correspond well with those of *E. parviflorum*, and they are even said to have a trilobulate plate at the base of the lip, as shown in *E. parviflorum*.

Epidendrum gratiosum var. *linearifolium*, of which we have a photograph and a drawing of the material in the Reichenbach Herbarium which Cogniaux later made the varietal type, apparently differs from *E. gratiosum* only in having linear elongate leaves and sometimes a more branched panicle. This combination is therefore synonymous with *E. parviflorum*. However, in accordance with the Rules of Botanical Nomenclature, it is necessary, in naming this variety, to disregard the specific name, "parviflorum," and to adopt the name "linearifolium" since it is the first varietal epithet to be used for this concept.

Epidendrum patulipetalum, of which the description is supplemented by a floral analysis made under the supervision of Dr. Schlechter, has sepals which are exactly as small as those of *E. parviflorum* (*E. paniculatum* var. *linearifolium*). As drawn, the lip is even smaller than in typical *E. parviflorum* and is thus more similar to the Ecuadorian collection (*Penland & Summers 204*) referred to *E. parviflorum*. Moreover, the two basal calli are represented as more prominent than in the Ecuadorian collection of *E. parviflorum*. Considering the known variability of the lip in this alliance, however, it seems entirely justifiable to reduce this concept.

Epidendrum paniculatum *Ruiz & Pav.* var. **unguiculatum** *C. Schweinfurth var. nov.*

Herba pedunculo elongato plurispathato et floribus majoribus et labelli lobis lateralibus dolabriformibus et lobo intermedio distincte quadrato-unguiculato a specie differt.

Plant 80 cm. or more tall (stem broken off). Stem stout, up to 1 cm. in diameter near the base. Leaves elliptic or oblong-elliptic, up to 18 cm. long and 4 cm. wide. Inflorescence loosely paniculate; pedumcle about 22 cm. long, provided with four strict oblong-lanceolate conduplicate spathes. Flowers cream-colored, larger than in the species. Dorsal sepal 18–19 mm. long, 5 mm. wide above. Lateral sepals 19.6–20 mm. long, 5.6–6 mm. wide above. Petals 18–19 mm. long, 1.2–1.5 mm. wide above. Lamina of lip about 8.7 mm. long and 16 mm. wide across the lateral lobes when expanded; lateral lobes broadly dolabriform, irregularly lobulate on the rounded outer margin; mid-lobe from a quadrate base abruptly dilated into a pair of subhorizontal lightly recurved oblong lobules, lightly retuse and sharply apiculate in the middle; disc with a pair of small rounded basal calli sur-

rounding a fleshy median ridge which extends to the apex of the lip, the median ridge being supported on each side by a shorter smaller ridge. Column about 14.2 mm. long. Pollinia four, complanate, the two outer being semilunate and the two inner smaller and lanceolate in outline.

In view of the extreme variability in the size of the flowers and in the form and lobing of the lip in *E. paniculatum*, I consider it advisable to recognize only as a well-marked variety this plant which differs from the usual form in having a relatively elongate peduncle with several conduplicate spathes, and larger flowers with the lateral lobes of the lip strongly flabellate and lobulate on the outer margin and especially in having a prominent quadrate-unguiculate mid-lobe.

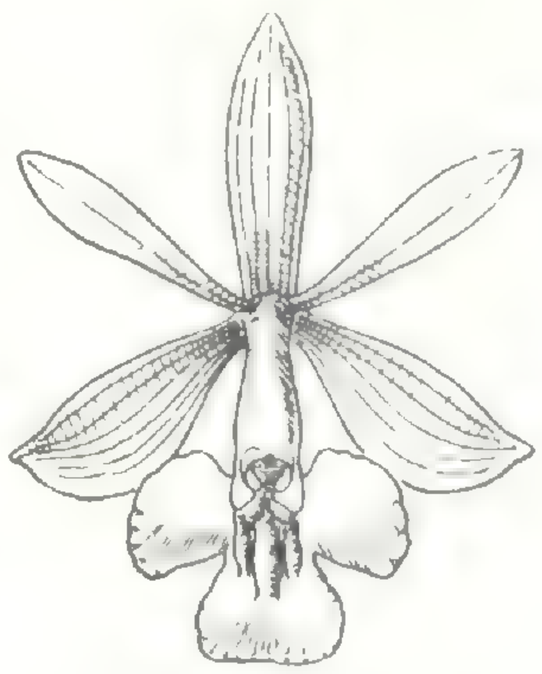
LORETO: Mishuyacu, near Iquitos, at 100 meters altitude, epiphyte in forest beside the river, May–June 1930, *G. Klug 1401* (TYPE in Herb. Field Mus. No. 624989; ISOTYPE in U. S. Nat. Herb. No. 1456335).

Epidendrum pubiflorum *C. Schweinfurth sp. nov.*

Herba magna et robusta ut videtur. Folia disticha, oblonga vel elliptico-oblonga, apice rotundata, amplectentia. Inflorescentia terminalis, divaricato-paniculata, arcuatis multifloris cum ramis. Flores parvi, crassiores. Sepalum dorsale obovato-oblongum vel oblanceolato-oblongum, obtusum. Sepala lateralia oblique elliptico-obovata, conspicue mucronata. Petala lineari-oblanceolata, subacuta. Labellum columnae valde adnatum; lamina in circuitu suborbicularis, profunde trilobata, basi cordata; lobi laterales oblique dolabriformi-ovati, extus rotundati et irregulariter crenulati; lobus medius subaequalis, breviter cuneato-obovatus, apice leviter retusus; discus basi bicallosus et antice breviter tricarinatus. Columna brevis, valde dilatata.

Plant apparently large and stout (entire lower portion lacking in my specimen). Stem concealed by close tubu-

lar leaf-sheaths. Leaves distichous, oblong or elliptic-oblong, minutely bilobulate at the rounded apex, cuneate at the sessile clasping base, up to 11.5 cm. long and 2.3 cm. wide, spreading, subcoriaceous. Inflorescence terminal, consisting of a large spreading panicle of about 5 distichous arcuate, many-flowered branches which are 26.5 cm. or less long; rachis finely pubescent. Floral bracts inconspicuous, lanceolate, shorter than the short gradually dilated pedicellate ovary. Pedicellate ovary and outer surface of the sepals densely short-pubescent. Flowers small, rather fleshy. Dorsal sepal obovate-oblong or oblanceolate-oblong, obtuse and dorsally subapically mucronate, 9–10 mm. long, 3–3.2 mm. wide, 3-nerved, lightly concave. Lateral sepals obliquely elliptic-obovate, acute with a prominent dorsal mucro, 10.8–11 mm. long, 4.6–4.8 mm. wide, concave, 5-nerved. Petals linear-oblanceolate, lightly oblique, 9.5–9.9 mm. long, 1.9 2 mm. wide above, subacute, 1-nerved. Lip adnate to the column nearly to its apex: lamina suborbicular in outline, sharply 3-lobed, deeply cordate at base, about 7 mm. in greatest length and 9–9.5 mm. wide across the lateral lobes; lateral lobes spreading, obliquely dolabriform-ovate, with the rounded outer margins irregularly crenulate and the anterior margin (forming the posterior wall of the sinus) straight; mid-lobe subequal, shortly cuneate-obovate, lightly retuse, with the lobules undulate-crenate; disc bicallose at base with three short fleshy approximate keels (the central one longest) just in front. Column short, strongly dilated in front just above the base, about 5.5 mm. long on the dorsal surface, produced on each side into a pair of shallowly transverse-oblong auricles.



Epidendrum pubiflorum, flower expanded, one and one half times natural size.

Epidendrum pubiflorum is allied to *E. lanipes* Lindl., but differs in having broader sepals and dissimilar lobes of the lip and column, as well as in having shorter broader leaves.

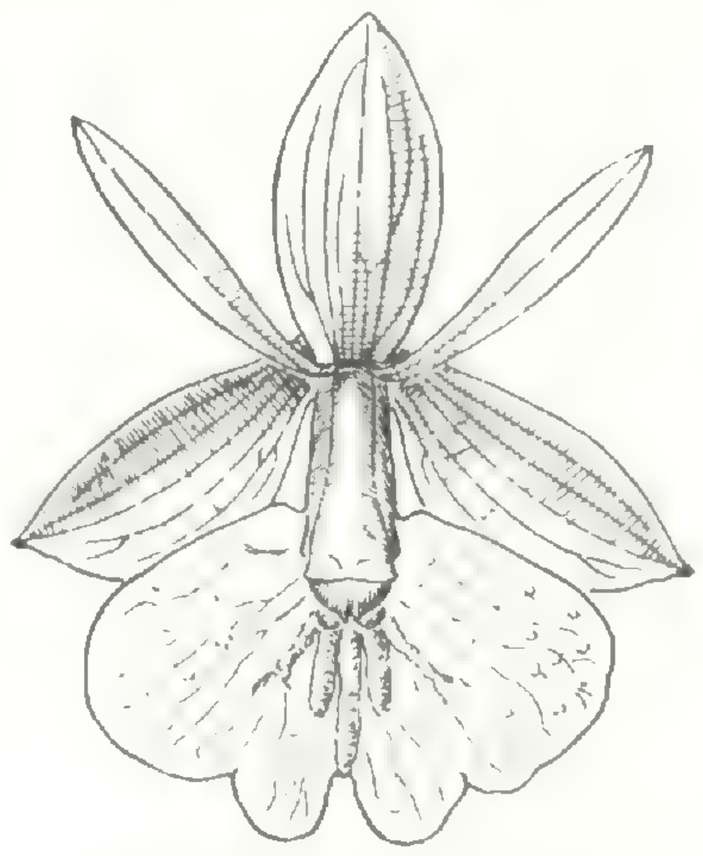
PERU: Amazonian slope of the Andes, at about 3000–3300 meters altitude, 1927, *Boyd Ehle s.n.* (TYPE in Herb. N.Y. Bot. Gard.).

Epidendrum rectopedunculatum *C. Schweinfurth sp. nov.*

Herba robusta, elata, epiphytica. Caulis strictus, vaginis tubulatis arctis omnino celatus. Folia numerosa, disticha, saepissime ovato-lanceolata, acuminata vel subacuta, amplectentia, carnosa, patentia. Inflorescentia stricta, ramis brevibus late patentibus densifloris supra donata. Flores parvi, subcarnosi, segmentis patentibus. Sepalum dorsale obovato-ellipticum, acutum. Sepala lateralia oblique elliptico-obovata, acuta. Petala oblanceolato-linearia, leviter falcata, obtusa vel retusa. Labellum columnae valde adnatum; lamina in circuitu transverse ovalis, carnosa, profunde emarginata, antice in medio abrupte semi-orbiculari-bilobulata, utrinque rotundata, basi bicallosa. Columna brevis, crassa, apice truncata.

Plant stout, about 52 cm. tall, epiphytic. Roots fibrous, flexuous, glabrous. Stem strict, terete, many-leaved, entirely concealed by close tubular sheaths which produce leaves except near the base. Leaves numerous, distichous, ovate-lanceolate (rarely oblong-ovate or oblong-elliptic), subacute to acuminate, subrounded at the clasping base, up to 8.8 cm. long and 2.4 cm. wide, spreading, fleshy, shining on the upper surface. Inflorescence terminal, strict, about 11.3 cm. long, with the rachis closely invested by imbricating tubular evanescent sheaths, provided above with remote abbreviated widely spreading branches which are densely flowered and commonly short-branched. Floral bracts minute, triangular-

ovate, squarrose. Flowers small, subfleshy, mignonette and flesh-red, with spreading segments. Sepals acute, 5-nerved. Dorsal sepal obovate-elliptic, up to 7.6 mm. long and 3.3 mm. wide. Lateral sepals obliquely elliptic-obovate, about 8 mm. long and 4 mm. wide. Petals oblanceolate-linear, subacute to retuse, lightly falcate, up to 7 mm. long and 1.3 mm. wide, 1- or obscurely 3-nerved. Lip adnate to the column nearly to its apex; lamina fleshy, transversely oval in outline, abruptly bilobulate in the middle with two semiorbicular lobules, broadly rounded on each side, subtruncate-cuneate at the base, up to 7 mm. long on either side of the center and 12.8 mm. wide; disc with a pair of subglobose calli at the base and three to five more or less distinct fleshy ridges in front. Column short and stout, gently dilated upward in front, up to 4 mm. long, truncate at the irregular apex. Ovary with a semiellipsoid vesicle.



Epidendrum rectopedunculatum, flower, expanded, three times natural size.

Epidendrum rectopedunculatum is closely allied to the Central American *E. pachyrachis* Ames, but differs in having larger leaves, in having an erect long-pedunculed inflorescence which is provided with several remote short branches, in its dissimilar petals and in the absence of a sharp apicule in the center of the lip. This concept appears to be so similar to *E. pachyrachis*, however, that, with the aid of more material of either species, it may be found specifically inseparable.

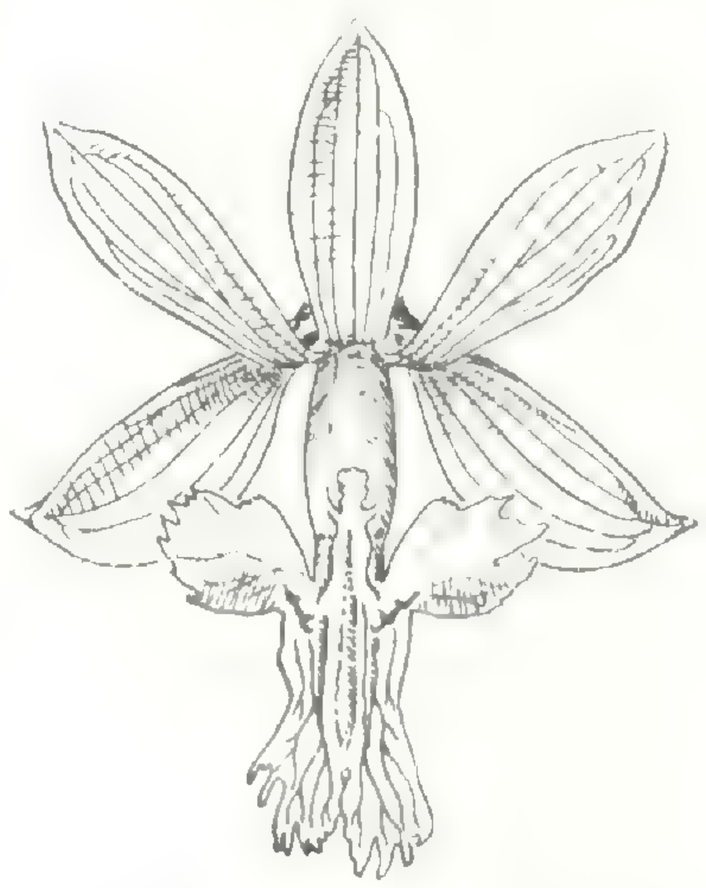
LORETO: Vicinity of Iquitos, at 100 meters altitude, in dense forest on living tree, January to February 1937, *G. Klug 10083* (TYPE in Herb. Ames No. 61553).

Epidendrum reflexilobum *C. Schweinfurth sp. nov.*

Herba elata, gracilior. Radices fibratae, elongatae. Caulis basi decumbens, vaginis tubulatis supra foliiferis ommino celatus. Folia disticha, ovato-oblonga vel oblonga, apice rotundata, basi amplectentia, carnosa ut videtur. Pedunculus elongatus, strictus, vaginis aretis tubulatis ommino tectus. Racemus terminalis, brevis, dense pluriflorus, nutans. Sepala petalaque recurvata. Sepalum dorsale ovato-elliptieum, acutum. Sepala lateralia oblique elliptico-oblonga, dorso carinata, acuta. Petala cuneato-spathulata, acuta. Labellum columnae valde adnatum; lamina profunde trilobata, basi cordata; lobi laterales oblique ovales, reflexi, extus irregulariter lacerato-dentati; lobus medius multo major, obovato-oblongus, profunde bilobatus; discus breviter tricarinatus. Columna brevis, supra dilatata, apice utrinque triangulari-auriculata.

Plant tall, rather slender. Roots fibrous, elongate, glabrous, whitish, mostly simple, stout for the plant. Stem erect from a short decumbent base, entirely concealed by close tubular sheaths which are leaf-bearing except near the base, about 19 cm. or less long. Leaves distichous, nine or less, ovate-oblong to oblong (rarely ovate), rounded and minutely bilobed at the apex, sessile at the clasping base, apparently fleshy, up to 5.5 cm. long and 1.5 cm. wide (much smaller below). Pedunele elongate, strict, entirely concealed by numerous close tubular scarious sheaths, about 43.5 cm. or more long. Raceme terminal, short, nodding, densely several- to many-flowered, about 4 cm. or less long. Floral bracts narrowly triangular, long-acuminate, spreading, the lower ones much the longest. Flowers small, scarlet with yellow on the lip; sepals and petals recurved. Dorsal sepal ovate-elliptic, acute, 7-nerved, 11.9 12.5 mm. long and 4.9 mm. wide. Lateral sepals obliquely elliptic-oblong, acute with a dorsal mucro, carinate, 6- to 8-nerved, about 13 mm. long

and 5 mm. wide. Petals oblanceolate or cuneate-spatulate, acute, 13.2–13.5 mm. long, 4 mm. wide, lightly oblique, 3- to 5-nerved. Lip adnate to the column nearly to its tip; lamina sharply 3-lobed, much surpassing the rest of the perianth, cordate at base; lateral lobes obliquely oval in outline, reflexed, about 6.5 mm. long, 4–5 mm. wide, irregularly lacerate-dentate on the outer margins, concave at the base; mid-lobe much larger than the lateral lobes, obovate-oblong in outline with a subquadrate claw, deeply bilobed with porrect unequal lobules which are irregularly lacerate at the apex, 8.1–10 mm. in greatest length and 7 mm. wide across the apical portion; disc with three short fleshy keels of which the central one is longest and the lateral ones with their fleshy lobulate base spread onto the lateral lobes. Column short and stout, lightly dilated above in front, extended on each side into a fleshy erect triangular auricle; clinandrium denticulate on each side. Anther semiglobose, 4-celled. Pollinia four, complanate, slender-pyriform.



Epidendrum reflexilobum, flower expanded, one and one half times natural size.

Epidendrum reflexilobum is allied to *E. tricarinatum* Rolfe, but appears to differ in having scarlet and yellow, not purple, flowers, in the form of the petals and in the reflexed oval lateral lobes of the lip whose lateral keels are entire except at the base.

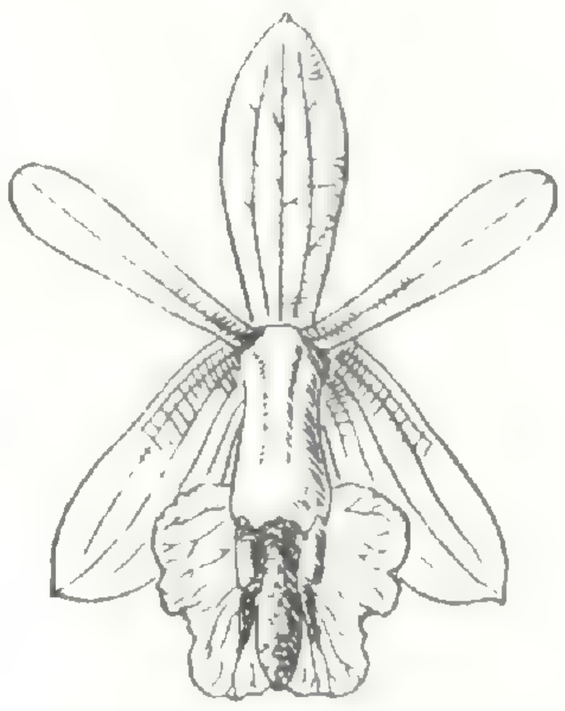
HUANUCO: Yanahuanca, at about 3070 meters altitude, on rocks among shrubs, flowers "scarlet except bright yellow inner and lower portions of lip," June 16–22, 1922, *Macbride & Featherstone 1290* (TYPE in Herb. Field Mus. No. 517800; ISOTYPE in Herb. Ames No. 61589).

Epidendrum refractoides *C. Schweinfurth sp. nov.*

Herba epiphytica, robusta. Caulis erectus, leviter flexuosus, vaginis laxis imbricatis omnino celatus. Folia disticha, late patentia, oblongo-elliptica vel ovalia, apice rotundata, basi amplectenti rotundata. Inflorescentia terminalis, arcuata, laxiflora, laxe paniculata, ramis strictis brevibus pauciflоris spatha suffultis. Flores parvi, virides, carnosi. Sepalum dorsale obovato-oblongum, apice dorso mucronatum. Sepala lateralia oblique oblongo-obovata, apice dorso mucronata. Petala anguste cuneato-oblanceolata, obtusa. Labellum columnae valde adnatum; lamina ovato-quadrata, apice truncato leviter bilobata, basi cordata, simplex vel leviter trilobata (utrinque incisa) et crenato-dentata. Columna generis.

Plant stout, epiphytic, about 37.4 cm. or more tall. Roots fibrous, flexuous, glabrous. Stem erect but lightly flexuous, about 23 cm. high, entirely concealed by loose imbricating infundibuliform sheaths of which all but the lowermost are leaf-bearing. Leaves distichous, about eight, oval to oblong-elliptic, rounded with a minute apicule at the apex, deeply clasping at base, widely spreading up to 12 cm. long and 4.2 cm. wide (often progressively shorter below), chartaceous, with the mid-nerve carinate beneath. Inflorescence terminal, arcuate, about 48 cm. or less long, loosely paniculate with appressed short branches; pedumcle up to 14 cm. long, entirely concealed by three strict conduplicate imbricating spathes which are infundibuliform below; branches of the panicle in the lower portion of the loose inflorescence, loosely 3- to 5-flowered, subtended by an infundibuliform spathe similar to those of the pedumcle. Flowers small, green, fleshy. Dorsal sepal obovate-oblong, about 11 mm. long and 4.8 mm. wide, truncate-obtuse with a dorsal mucro, 3-nerved. Lateral sepals obliquely oblong-obovate, 11.8–12 mm. long and 5 mm. wide, acute by reason of a dorsal mucro,

3- or 4-nerved. Petals narrowly cuneate-oblanceolate, 10.5 mm. long, 2.8 mm. wide above, obtuse, 1-nerved. Lip adnate to the column nearly to its apex; lamina ovate-quadrate in outline, deeply cordate at the base, simple or obscurely 3-lobed (lightly indented in the middle of each side), lightly retuse-apiculate in the middle of the truncate apex or shallowly bilobulate, irregularly crenate-dentate on each side especially in the middle, 7.8 mm. in greatest length and 9 mm. in greatest width near the base; disc with a pair of large fleshy complanate-ellipsoid calli at the base and with three to five fleshy ridges in front, the central ridge extending nearly to the apex. Column short, stout, strongly dilated upward in front, about 6.4 mm. long on the dorsal surface, crenate-dentate at the truncate apex.



Epidendrum refractoides, flower expanded, one and one half times natural size.

Epidendrum refractoides seems to be closely allied to the Venezuelan *E. refractum* Lindl., but differs in having paniculate inflorescences of smaller flowers with narrow petals and an indistinctly 3-lobed lip.

HUANUCO: Cani, seven miles northeast of Mito, at about 2600 meters altitude, "on tree branch in dense stream-wood," April 16–26, 1923, *J. Francis Macbride 3391* (TYPE in Herb. Field Mus. No. 534461; ISOTYPE in Herb. Ames No. 61559).

Epidendrum Schlechterianum *Ames* var. **longirepens** *C. Schweinfurth var. nov.*

Herba parva, rhizomate longo distincto et foliis minimis et petalis latioribus a specie differt.

Plant small, with a long creeping flexuous rhizome formed by short successive connectives between the abbreviated stems, producing numerous fibrous adventitious roots. Stems very short, entirely concealed by the

loose flaring unjointed imbricating leaf-sheaths, about 5.8 mm. long. Leaves very small, distichous, approximate, spreading-recurved, oblong-ovate, about 7.5 mm. or less long and 4.4 mm. wide when expanded, rounded at the apex with a minutely bilobulate and mucronate tip, convex with a sulcate center, apparently very fleshy. Flowers apparently solitary, sessile, green-rose, much smaller than in the usual typical form of the species. Dorsal sepal elliptic-lanceolate or ovate-lanceolate, obtuse or subacute and apiculate, about 8.9 mm. long and 3.4 mm. wide, dorsally carinate. Lateral sepals similar to the dorsal sepal, elliptic-lanceolate or ovate-lanceolate, acute and apiculate, oblique at base with center adnate to the column, 8.7–9 mm. long and 3 mm. wide, with a prominent dorsal winged keel which is denticulate above. Petals oblong or elliptic-oblong, acute, about 8 mm. long, 2.8 3 mm. wide, obliquely adnate to the column at base. Lip adnate to the column nearly to the apex; lamina suborbicular-cordate or broadly ovate-cordate, rounded and abruptly apiculate at the apex, about 5 mm. long and 5.9 mm. wide, fleshy with finely denticulate margins. Column abbreviated, terminating on each side in a prominent obliquely rounded-subquadrate auricle, denticulate on the retuse middle portion, about 3.9 mm. long to the tip of an auricle.

The differences of this variety from the highly variable *E. Schlechterianum* are chiefly vegetative. The long creeping rhizome and small leaves are distinctly divergent. As to size, the flower is smaller than usual in the typical form, but some flowers of *E. Schlechterianum* are quite as small. The petals of the variety, however, tend to be broader and the column shorter than in the species.

LORETO: Mishuyacu, near Iquitos, at 100 meters altitude, in forest, April 1930, *G. Klug 1274* (TYPE in U.S. Nat. Herb. No. 1456070; ISOTYPES in Herb. Field Mus. No. 624992 and in Herb. Ames No. 61887).

Epidendrum subreniforme *C. Schweinfurth sp. nov.*

Herba mediocris, epiphytica. Caulis robustus, foliorum vaginis distichis imbricatis omnino obtectus. Folia parva, elliptica, acuta, patentia. Inflorescentiae terminales, laxe pauciflorae. Flores grandiores, viridi-flavi. Sepalum dorsale elliptico-lanceolatum, acutum. Sepala lateralia semiovalia vel oblique elliptico-lanceolata, breviter acuminata, dorso carinata. Petala lineari-oblanceolata, acuta vel subacuta. Labellum columnae valde adnatum; lamina subsimplex, in circuitu reniformis, utrinque leviter contracta, apice late rotundato leviter retusa et apiculata. Columna sursum leviter dilatata, supra utrinque auriculato-dilatata.

Plant medium-sized, about 21.5 cm. high. Roots stout, fibrous, elongate, numerous. Stem stout, simple except for one abbreviated ascending branch above, about 19.5 cm. tall, entirely concealed by leaf-bearing sheaths which are close, distichously imbricating, complanate and mostly scarious. Leaves small, elliptic, acute, sessile, clasping, spreading, up to 4.6 cm. long and 1.5 cm. wide, submembranaceous. Inflorescence terminal, abbreviated, recurved, loosely about 4-flowered. Flowers rather large, greenish yellow. Dorsal sepal elliptic-lanceolate, acute, about 19 mm. long and 6.5 mm. wide, 7-nerved below the middle. Lateral sepals semioval or obliquely elliptic-lanceolate, about 22 mm. long and 8.5 mm. wide, shortly acuminate, concave, dorsally carinate especially above the middle. Petals linear-oblanceolate, acute or subacute, about 18.3 mm. long and 3.8 mm. wide, 3-nerved. Lip adnate to the column nearly to its apex; lamina subsimple, reniform in outline, lightly contracted on each side, with the center channelled and the sides convex-spreading in natural position, lightly retuse and bluntly apiculate at the broadly rounded apex, about 12 mm. long in the middle and 25.8 mm. wide near the cordate base, ob-

securely bicallose at the base. Column stout, gradually dilated above where it is produced into a broad subquadrate auricle on each side, about 12 mm. long from the base to the apex of an auricle.

Epidendrum subreniforme is apparently allied to the Brazilian *E. Burgeri* Schltr., but has shorter broader leaves and larger flowers with an apiculate lip.

HUANUCO: Cushi, at about 1500 meters altitude, on small tree in sun, June 19–23, 1923, *J. Francis Macbride 4543* (TYPE in Herb. Field Mus. No. 535620).

EXPLANATION OF THE ILLUSTRATIONS

PLATE VI. EPIDENDRUM CARNOSIFLORUM *C. Schweinf.* 1, plant, one half natural size. 2, lateral sepal, two and one half times natural size. 3, dorsal sepal, two and one half times natural size. 4, petal, two and one half times natural size. 5, lip and column from side, natural position, two and one half times natural size. 6, lip and column from above, natural position, two and one half times natural size.

EPIDENDRUM LATISEGMENTUM *C. Schweinf.* 7, plant, one half natural size. 8, flower, expanded, natural size. 9, lip and column from side, natural size. 10, anther, showing cells, five times natural size. 11, pollinium, ten times natural size.

PLATE VII. EPIDENDRUM ELATUM *C. Schweinf.* 1, plant, one half natural size. 2, flower, expanded, one and one half times natural size. 3, flower from side, natural position, one and one half times natural size.

PLATE VIII. EPIDENDRUM MACBRIDEI *C. Schweinf.* 1, plant, one half natural size. 2, flower, expanded, twice natural size. 3, pollinia in situ, ten times natural size.

EPIDENDRUM LIGULIFERUM *C. Schweinf.* 4, plant, one half natural size. 5, flower, expanded, natural size.

PLATE IX. EPIDENDRUM MAGNICALLOSUM *C. Schweinf.* 1, plant, one half natural size. 2, flower, expanded, two and one half times natural size. 3, flower from side, natural position, two and one half times natural size.

EPIDENDRUM SUBRENIFORME *C. Schweinf.* 4, plant, one half natural size. 5, flower, expanded, natural size. 6, flower from side, natural position, natural size.

PLATE X. EPIDENDRUM MINUTIDENTATUM *C. Schweinf.* 1, plant, one half natural size. 2, flower, expanded, twice natural size.

EPIDENDRUM ORBICULATUM *C. Schweinf.* 3, plant, one half natural size. 4, flower, expanded, natural size.

PLATE XI. EPIDENDRUM MINUTIFLORUM *C. Schweinf.* 1, plant, natural size. 2, flower from side, natural position, five times natural size. 3, dorsal sepal, five times natural size. 4, lateral sepal, five times natural size. 5, petal, five times natural size. 6, column and lip from side, five times natural size. 7, column and lip from above, five times natural size. 8, anther from above, ten times natural size. 9, anther from below, ten times natural size.

EPIDENDRUM NANUM *C. Schweinf.* 10, plant, natural size. 11, flower expanded, one and one half times natural size. 12, lip and column from side, natural position, two and one half times natural size. 13, lip, expanded, two and one half times natural size.

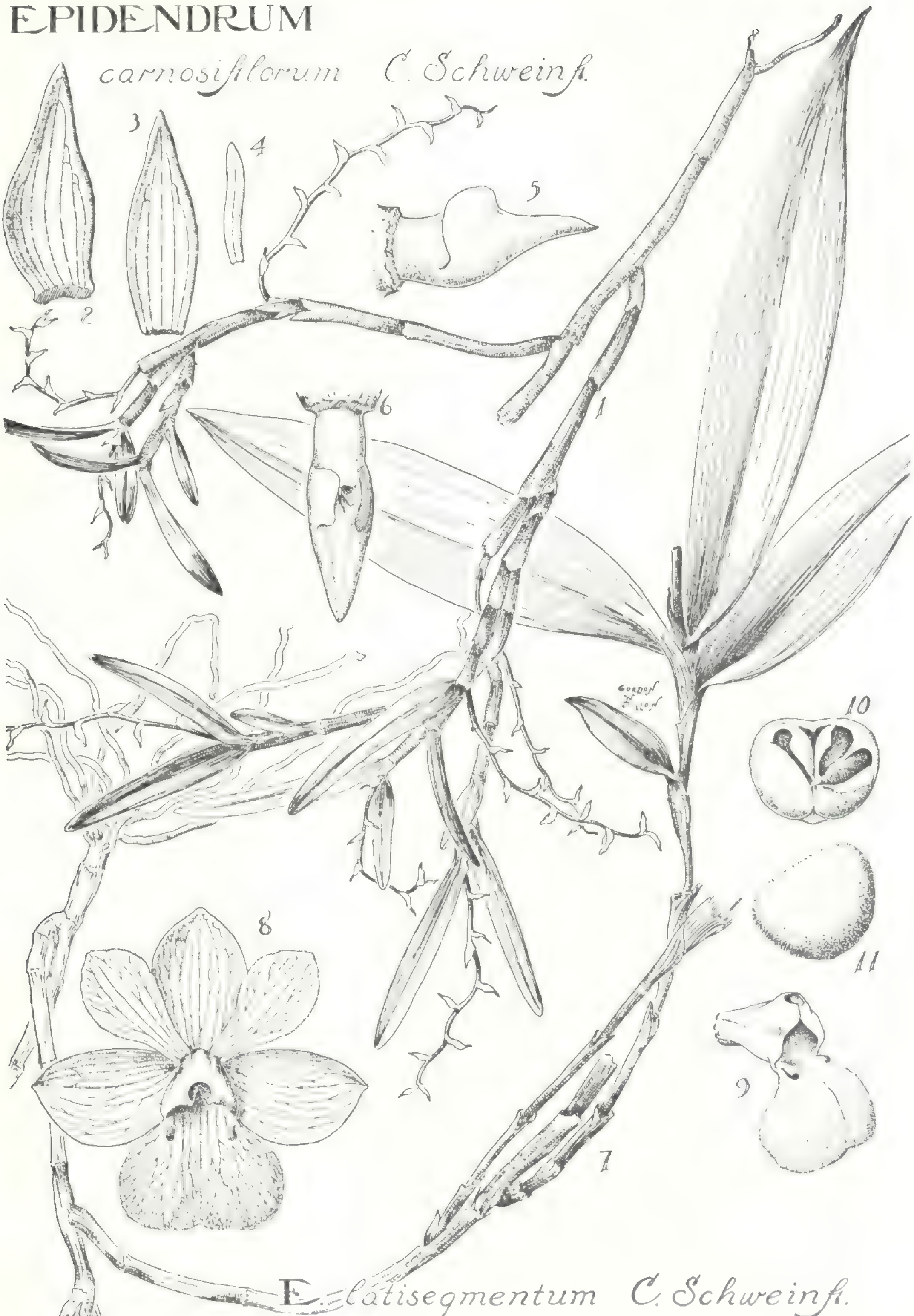
PLATE XII. EPIDENDRUM AQUATICOIDES *C. Schweinf.* 1, plant, one half natural size. 2, flower, from above, expanded, twice natural size. 3, lip and column from side, twice natural size.

PLATE XIII. EPIDENDRUM BIROSTRATUM *C. Schweinf.* 1, plant, one half natural size. 2, flower, from above, expanded, twice natural size.

PLATE VI

EPIDENDRUM

carnosiflorum C. Schweinf.



E. latisegmentum C. Schweinf.

PLATE VII

EPIDENDRUM *elatum* *C. Schweinf.*

PLATE VIII

EPIDENDRUM

Macbridei C. Schweinfth.

E. ligulíferum
C. Schweinfth.

PLATE IX

EPIDENDRUM

magnicallosum C. Schweinf.

E. subreniforme C. Schweinf.

PLATE X

EPIDENDRUM minutidentatum C. Schweinf.

PLATE XI

EPIDENDRUM

minutiflorum C. Schweinf.

E. nanum C. Schweinf.

PLATE XII

EPIDENDRUM

aquaticoides C. Schweinf.

PLATE XIII

EPIDENDRUM

birostratum C. Schweinfs.

BOTANICAL MUSEUM LEAFLETS
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AFRICAN ORCHIDS. XIII

BY

V. S. SUMMERHAYES

(*Royal Botanic Gardens, Kew*)

THE LEAFLESS ANGRAECOID ORCHIDS

LEAFLESS MEMBERS of the large group of Monopodial Orchids are found in all the main tropical regions, for example, the genus *Taeniophyllum* Bl. in Indo-Malaya and the genera *Campylocentrum* Benth. and *Dendrophylax* Reichb.f. in tropical America. In Africa, including the Mascarene Islands in the broad sense, such orchids have generally been looked upon, probably correctly, as leafless representatives of the large group of Angraecoid orchids characteristic of that continent.

Until now all these leafless plants have either been placed in one genus or have been allocated to the various aggregate genera *Angraecum* Thouars, *Listrostachys* Reichb.f. and *Rhaphidorrhynchus* Finet according to the views of the authors dealing with them. The earliest distinct generic name for any leafless African monopodial orchid is *Gussonea* proposed by A. Richard in 1828 for *Angraecum aphyllum* Thouars (in Mém. Soc. Hist. Nat. Paris 4 (1828) 67). This name was afterwards adopted by Ridley (in Journ. Linn. Soc. Lond. Bot. 21 (1885) 391) who transferred several species from other genera and described some new ones. More recently Schlechter (in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 89–94) also

accepted *Gussonea* in his general treatment of the Angraecoid orchids. Unfortunately *Gussonea* A. Rich. is a later homonym, the name having been used previously by Sprengel, under the alternative spelling *Gussonia*, for a genus of *Euphorbiaceae* now considered congeneric with *Sebastiana*. The next available name is *Microcoelia* proposed by Lindley in 1830 (Gen. & Sp. Orch. Pl. 60) for a Madagascar plant, and this is undoubtedly the correct name for the leafless Angraecoid orchids assuming that they are all congeneric.

Schlechter states in his introductory remarks (l.c. p. 72) that the leafless African species all possess a similar column structure and on that basis he puts them into a single genus, *Gussonea*. However, he points out elsewhere (p. 93) that the structure of his *Angraecum macrorhynchium* (*Gussonea macrorhynchia* Schltr.) is so different from that of other species that it may prove to belong to a separate genus. He divides *Gussonea* into two sections, namely, section *Eu-gussonea* with elongated climbing stems, and section *Taeniophylloides* with a very short stem, the whole plant strongly resembling members of the genus *Taeniophyllum*. He gives no correlated floral differences so presumably he had detected none of any significance.

Finet (in Mém. Soc. Bot. France 9 (1907) 34, 35, 47, 50), on the other hand, placed the species in several different genera, but his genera are many of them so artificial that his separation of the leafless species is little evidence of their real distinctiveness. It has, however, been suggested, for example, by Braid (in Bull. Misc. Inform. Kew (1926) 324) and the present writer (in Bull. Misc. Inform. Kew (1936) 232) that the striking common feature of leaflessness may have been given too much weight and that perhaps several genera are represented among the various species described. If this be true, do some of

the species belong to otherwise leafy genera or should they form distinct leafless genera?

In view of this doubt as to the generic conformity (or otherwise) of the various species and the fact that many new combinations will in any case be necessary under the correct generic name *Microcoelia*, I have re-investigated the genus. Unfortunately owing to war conditions I have been unable to examine the type-specimens of several of the species and accurate placing of these will have to await a more favorable opportunity. It has seemed worth while, however, to place on record such decisions as could profitably be made from the material and information available.

The final result of this examination, put shortly, is that the species of *Microcoelia* form, on the whole, a natural genus, possessing many features in common apart from the leafless habit, but that several species have to be transferred to other genera. In addition I have discovered some remarkable forms which can only be satisfactorily treated as new genera.

The species most obviously differing from the others are those with the elongated climbing stems. These, of course, include the type of *Gussonea* (*G. aphylla* (Thouars) A. Rich.) and therefore form Schlechter's section *Eugussonea*. When, however, the name *Microcoelia* Lindl. is adopted for the genus, the type species is *M. exilis* Lindl., and this has a short stem. On examination of the long-stemmed forms I cannot see how they differ from the genus *Solenangis* Schltr. except in the leafless habit, so I have transferred them to this genus. *Angraecum macrorrhynchium* Schltr., mentioned already, is an aberrant form, for which I am creating a new genus described below.

Excluding the above, as well as some even more remarkable plants described below for the first time, the

genus *Microcoelia* contains some twenty-five or so species, but it is possible that some of these may prove to be conspecific. It is also practically certain that many new species yet await discovery, since the leafless habit renders the plants inconspicuous except when in flower, quite apart from the fact that some of the species are extremely small.

The type specimens of the new species are in the Kew Herbarium unless otherwise stated.

Microcoelia Lindl.

Microcoelia *Lindley* Gen. & Sp. Orch. Pl. (1830) 60—Summerhayes in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 403, 454.

Plantae epiphyticae, aphyllae. *Caulis* brevissimus, usque ad 3 cm. longus, radices flexuosas simplices vel ramosas saepius laeves emittens, apice cataphyllis scariosis minutis praeditus. *Inflorescentiae* ex axillis cataphyllorum exortae, singulae vel plures, racemosae, paucisque multiflorae, breves vel usque ad 20 cm. longae. *Flores* alternati, parvi vel parvuli, albi, rosei vel aurantiaci, breviter vel longiuscule pedicellati; bracteae saepius minimae, basi vaginantes. *Sepala* saepius ± connivентia, lanceolata vel ovata, acuta vel obtusa, lateralia obliqua quam intermedium saepe majora, saepius basi antice ampliata. *Petala* sepalis ± similia, sed saepe minora vel angustiora, interdum obovata vel oblonga. *Labellum* simplex vel basi obscure trilobatum, saepe pro rata parvum vel minimum, oblongum, ovatum, lanceolatum vel orbiculare, ecallosum; calcar breve vel elongatum, globosum, conicum vel cylindricum, interdum apicem versus leviter vel modice inflatum, ore angustum vel latiusculum. *Columna* brevis vel antice brevissima, interdum ± recurvata; androclinium reclinatum vel adscendens; anthera ± hemisphaerica, antice breviter vel saepius longe producta;

pollinia duo, sphaeroidia vel ± pyriformia, stipite uno sed raro superne diviso lineari vel ligulato apice saepe dilatato, viscidio uno; stigma excavatum; rostellum modice vel valde productum, saepius decurvatum et columnae ± adpressum, interdum parte distali incurvatum vel porrectum, viscidio amoto ± profunde bipartitum.

Species typica:—*M. exilis* Lindl.

Characteristic features are the short stem, simple racemose inflorescences with flowers arising singly, the almost entire lip, the short column, in which the androclinium is rarely horizontal being usually markedly sloping upwards towards the back and sometimes very much so, the common stipes and viscidium and the deeply-cleft elongated rostellum. This latter is usually adpressed to the column in the lower part but may be curved upwards in the distal part or rarely is wholly divergent. After removal of the viscidium the two lobes are clearly evident.

Most of the characters, such as flower size, shape of perianth members, size of lip, length and shape of spur, nature of column, shape of pollinarium and rostellum, exhibit more or less continuous gradations from one extreme to the other and thus indicate the entity of the genus. It is, however, possible to separate three groups or sections in each of which the floral characters are combined to give a more or less recognisable facies. I have therefore arranged the species in these sections, which are shortly characterised, but as I have not seen all the species some transferences may be necessary later.

Section I. Eu-microcoelia Summerhayes.

Flores parvi vel minimi; labellum parvum vel mediocre; columna dorso brevis, clinandrio dorso tantum paulo adscendente; anthera antice vix producta; pollinii stipes brevis, viscidio pro rata magno ± quadrato ovato vel orbiculari.

Species typica sectionis:—*M. exilis* Lindl.

The species of this section are characterised by the small or even minute flowers and the column structure. The androclinium is almost horizontal or at most gently sloping upward from the front while the rostellum-lobes are comparatively short.

1. **Microcoelia conica** (*Schlechter*) *Summerhayes comb. nov.*

Angraecum conicum Schlechter in Engler Bot. Jahrb. 38 (1906) 160.

(*Gussonea conica* Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 91, et in Fedde Repert. Spec. Nov. Beih. 68 (1932) t. 96, no. 382.

Mozambique: Near Beira, April 1885, *Schlechter*.

I have not seen this species but from the description and illustration it should fall into this section. Schlechter's comparison with *Angraecum cyclochilum* Schltr., which is a species with an elongated stem, raises the possibility that the present species is similar in that respect, but unfortunately the description provides no definite information on this point. In his revision Schlechter places it among the short-stemmed forms (see above reference).

2. **Microcoelia exilis** *Lindley* Gen. & Sp. Orch. Pl. (1830) 61.

Angraecum Chiloschistae Reichenbach filius in Linnaea 20 (1847) 678, et in Walpers Ann. 1 (1849) 791—Bolus Ic. Orch. Austr.-Afric. 1 (1893) t. 6, et in Journ. Linn. Soc. Lond. Bot. 25 (1889) 186—Durand & Schinz Consp. Fl. Afr. 5 (1892) 40—Rolfe in Dyer Fl. Cap. 5, ii (1912) 74.

Gussonea exilis Ridley in Journ. Linn. Soc. Lond. Bot. 21 (1885) 493, et in Journ. Bot. 24 (1886) 292—

Schlechter in Beih. Bot. Centralbl. 33, Abt. 2 (1915) 425, et l.c. 36, Abt. 2 (1918) 92.
Mystacidium cæile Durand & Schinz Consp. Fl. Afr. 5 (1892) 52—Palacky Cat. Pl. Madag. (1906) 11.
Angraecum aphyllum Kraenzlin in Engler Pflanzenw. Ost.-Afr. C (1895) 157, non Thouars.
Rhaphidorrhynchus Chiloschistae Finet in Mém. Soc. Bot. France 9 (1907) 35.
Gussonea Chiloschistae Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 91.

KENYA COLONY: Muka, June 1902, *Kassner 941;* Rabai Hills, Kayobomu, April 1886, *Taylor;* Tsimba ("Jomvu"), June 1886, *Taylor.*

TANGANYIKA TERRITORY: Usambara, Kwa Mshuza, Aug. 1893, *Holst 8889a;* Bombuera, Feb. 1893, *Holst 2210;* Shinyanga, Ndama River, June 1931, *Burtt 3498;* Handeni District, between Zindeni and Mazima, Sept. 1933, *Burtt 4948;* Kilosa, June 1926, *Burtt 125.*

NORTHERN RHODESIA: Kafue River, Mwengwa, N. of Namwala, *Macauley 1055;* Zambesi River, Victoria Falls, N. bank, April 1932, *Thompson 1350.*

NYASALAND: [about 20 miles S. of Blantyre] Aug.-Sept. 1861, *Meller;* Shire River valley, Dec. 1865, *Waller;* Shiri Beesi, Shire River, April 1859, *Kirk;* near Blantyre, *Last.*

MOZAMBIQUE: Cafunipe (or Cafumpe), Feb. 1924, *Honey 801;* River Zonoe, in Manica, April 1907, *Johnson 258.*

NATAL: Port Natal, *Gueinzius 263;* Tongaat, *Saunders* (Herb. Bolus 6219); Zululand, White Umfolozoi River, Sept. 1937, *Harris;* near Sea-cow Lake, March 1867, *Sanderson 1007.*

MADAGASCAR: no locality, *Forbes*, s.n. (TYPE); 28.

Easily distinguished by the extremely small flowers and almost globular spur. I can see no differences in specimens throughout the above extensive range and can find no support for Schlechter's separation of the Madagascar species from that of the mainland nor for his suggestion that several allied species may occur on the mainland. During his later researches Schlechter seems to have adopted the view that orchids must, *ipso facto*, have limited distributions and interpreted his species accordingly.

All my investigations tend to show that many African orchids have even wider distributions than those credited to them by the earlier workers such as Reichenbach and Rolfe.

3. **Microcoelia Guyoniana** (*Reichenbach filius*) *Summerhayes comb. nov.*

Angraecum Guyonianum Reichenbach filius in Linnaea 22 (1849) 865, et in Walpers Ann. 3 (1852) 572—Schweinfurth Beitr. Fl. Aethiop. (1867) 198, 292—Martelli Florul. Bogos. (1886) 81—Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 148.

Saccolabium radicosum A. Richard Tent. Fl. Abyss. 2 (1851) 285.

Angraecum globulosum Hochstetter ex A. Richard l.c., *in synon.*

Microcoelia ? Taeniophyllum Hochstetter ex A. Richard l.c., *in synon.*

Aëranthus Guyonianus Reichenbach filius in Flora 48 (1865) 190, et in Otia Bot. Hamburg. (1881) 78.

Gussonea globulosa Ridley in Journ. Linn. Soc. Lond. Bot. 21 (1885) 391, *in obs.*—Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 93.

Mystacidium globulosum Durand & Schinz Consp. Fl. Afr. 5 (1892) 53.

Mystacidium radicosum Durand & Schinz l.c. 54.

Eritrea: Between Keren and Massawa, near Maldi, Aug. 1870, *Beccari* (not seen).

Abyssinia: Below Jeladjeranne, near Tacazze River, May 1840, *Schimper 1565* (Type); Amba Sea, June 1856, *Schimper 560.*

Sudan: Sennar Province, Fazogli, near Fadoga, April 1848, *Cienkowsky* (not seen).

Oubangui-Chari: River Baedou, 25 km. S. of Ippy, May 1927, *Tisserant 2171.*

Uganda: Toro District, May 1939, *Chandler 2798A.*

Kenya Colony: Maruessa, between Duruma and Teita, Jan. 1877, *Hildebrandt 2374;* Nairobi, Jan. 1932, *Napier* (Coryndon Mus. Herb.

1532); Nairobi, Aug. 1933, *Napier* (Coryndon Mus. Herb. 5213); Aberdare Mts., Kinangop district, December 1930, *Napier* (Coryndon Mus. Herb. 724).

Angola: Golungo Alto, near River Cuango and at Sobato de Bumba near River Casabella, May 1856, *Welwitsch 653;* Pungo Andongo, April 1875, *Soyaux 228.*

Northern Rhodesia: Mwinilunga District, S. of Matonchi Farm, Feb. 1938, *Paterson in Milne-Redhead 4651.*

Belgian Congo: Katanga, Elisabethville district, Oct. 1923, *Von Hirschberg 12.*

Here again is a species with a wide distribution in Tropical Africa. The species is closely allied to *M. Smithii* (Rolfe) Summerh. and to *M. Stolzii* (Schltr.) Summerh., both of which may eventually prove to be local races of *M. Guyoniana.* The species is characterised by the rather small flowers, the relatively large obovate or oblong lip and the more or less conical-cylindrical spur often slightly recurved at the apex.

I am adopting the epithet *Guyoniana* as in my opinion *Angraecum globulosum* Hochst. was not validly published by the distribution of Schimper's exsiccatae. It is laid down in the International Rules of Nomenclature (Art. 37) that names accompanying exsiccatae are only validly published if accompanied also by a description. The phrase in brackets on Schimper's label "Folia minima ad apicem caulis in globulum conferta" does not appear to me to be a formal description provided by Hochstetter but merely an extract from Schimper's field notes. The acceptance of such "descriptions" as validating might make it necessary to take up any new name accompanying distributed dried specimens if the collector's field notes reproduced on the label happened to contain some descriptive phrases. In addition in the present example the phrase does not distinguish the species from any other *Microcoelia*, the character described being a generic one.

4. **Microcoelia Hirschbergii** *Summerhayes sp. nov.* a *M. Guyoniana* (Reichb.f.) Summerh. inflorescentiis valde brevioribus, labelli calcari lamina duplo longiore ore angusto superne leviter inflato, pollinii viscidio quadrato pro rata magno differt.

Planta parva, epiphytica; caulis brevissimus, vix 1 cm. longus, radices numerosas flexuosas laeves 2–3 mm. diametro emittens. *Inflorescentiae* fasciculatae, usque ad 1.5 cm. longae, erectae, basi vaginis scariosis acutis praeditae, superne densiuscule usque ad 15-florae; pedunculus brevis; rhachis angulata, gracilis; bracteae lanceolatae, acuminatae, 1–2 mm. longae. *Flores* sub-erecti vel erecto-patentes, albi labello basi maculis duabus brunneis instructo; pedicellus cum ovario 8–9 mm. longus, tenuis. *Sepala* oblonga vel elliptico-oblonga, lateralibus obliquis, apice apiculata, 3.5–3.7 mm. longa, circiter 1.25 mm. lata, subtrinervia. *Petala* oblonga, apice acuta, 3 mm. longa, 1 mm. lata, uninervia. *Labellum* e basi angusta late ellipticum, acutum, integrum, in toto 3 mm. longum, antice 1.8 mm. latum, plurinervium; calcar ± cylindricum, ore leviter angustatum, superne leviter inflatum, apice obtusum, circiter 5–5.5 mm. longum. *Columna* brevissima, truncata, androclinio reclinato leviter excavato; anthera fere hemisphaerica, antice truncata vel brevissime producta; pollinia ellipsoidea, stipite quam pollinia breviore lineari-cylindrico, viscidio ± quadrato pro rata magno; rostellum porrectum, breve, subacutum; ovarium circiter 3 mm. longum.

Belgian Congo: Katanga, near Elisabethville, 4500–5000 ft. alt., on trees away from water, Sept. 1923, *Von Hirschberg 26* (Type in Nat. Herb., Pretoria).

A striking little species with a rather long cylindrical spur slightly narrower towards the mouth. The rostellum and also the stipes of the pollinium are exceptionally short the viscidium is relatively large being as broad

as the stipes is long, while the pollinia are larger than either.

5. **Microcoelia microglossa** *Summerhayes* in Hutchinson and Dalziel Fl. West Trop. Afr. 2 (1936) 454, et in Bull. Misc. Inform. Kew (1936) 231.

Southern Nigeria: Oban District, *Talbot*.

Very similar superficially to *M. caespitosa* (Rolfe) Summerh. in Section II but the column is very short with the androclinium only gently sloping upwards while the rostellum and its associated structures (stipes and viscidium) are also short and broad. Another striking feature is the exceptionally long spur (nearly 2 cm. long) which is suddenly widened near the apex and then tapers to the apex itself.

6. **Microcoelia Perrieri** (*Finet*) *Summerhayes comb. nov.*

Rhaphidorrhynchus Perrieri Finet in Lecomte Not. Syst. 1 (1909) 89.
Angraecum Perrieri Schlechter in Ann. Mus. Col. Marseille, sér. iii, 1 (1913) 198.
Gussonea Perrieri Schlechter in Beih. Bot. Centralbl. 33, Abt. 2 (1915) 425, et l.c. 36, Abt. 2 (1918) 94, et in Fedde Repert. Spec. Nov. Beih. 33 (1925) 378.

Madagascar: Ambodiroko, near Mevatanana, Oct. 1894, *Perrier de la Bathie 58* (not seen) (Type); Sambirano, valley of the Sambirano, July 1909, *Perrier 1841;* basin of the lower Mangoky, below Berowha, Sept. 1919, *Perrier 12865*.

Well characterised by the long slender rhachis and hair-like pedicels and the almost cylindrical spur about three times as long as the lip lamina and slightly constricted about one-third below the apex. The rostellum and stipes are short and the general structure strongly resembles that of *M. Hirschbergii* Summerhayes described above. *M. Perrieri*, however, has much longer

inflorescences, the perianth members more unequal especially the very oblique lateral sepals, the spur longer and constricted nearer the apex, and a relatively smaller viscidium.

7. **Microcoelia physophora** (*Reichenbach filius*) *Summerhayes comb. nov.*

Angraecum physophorum Reichenbach filius Otia Bot. Hamburg. (1881) 77.

Gussonea physophora Ridley in Journ. Linn. Soc. Bot. 21 (1885) 492—Schlechter in Beih. Bot. Centralbl. 33, Abt. 2 (1915) 425, et l.c. 36, Abt. 2 (1918) 94, et in Fedde Repert. Spec. Nov. Beih. 33 (1925) 378.

ZANZIBAR: Chwaka, near shore, Oct. 1932, *Vaughan 2016;* no locality, *Vaughan 1747.*

MADAGASCAR: Nosi-Komba Island, Dec. 1879, *Hildebrandt 3255* (TYPE); Tampaketso, west Madagascar, Sept. 1904, *Perrier de la Bathie 1771* (not seen); Marvorary, Boina, July 1922, *Perrier 14805* (not seen).

This species, which has not previously been recorded from Africa proper, can be recognised by the rather flattened roots, the long spur thickened at the apex and the narrow ligulate erect and concave lip lamina. The mouth of the spur is much narrowed by the infolding of the edges on either side. The androclinium slopes upwards somewhat but the porrect rostellum is comparatively short. The two pyriform pollinia are attached, by a stipes of moderate length and somewhat widened above, to a large heart-shaped viscidium.

8. **Microcoelia Smithii** (*Rolfe*) *Summerhayes comb. nov.*

Angraecum Smithii Rolfe in Bull. Misc. Inform. Kew (1895) 37, et in Dyer Fl. Trop. Afr. 7 (1897) 149.

Gussonea Smithii Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 94.

KENYA COLONY: Giryama and Tsimba Mts., 1887, *Taylor.*

TANGANYIKA TERRITORY: Between the sea and Mt. Kilimanjaro,

Smith; cult. Royal Botanic Gardens, Kew, Jan. 1895 (Type); Usambara, Amani, Jan. 1910 *Kraenzlin* (Herb. Amani 29957); Amani, Dec. 1928, *Greenway 1065.*

Evidently allied to *M. Guyoniana* (Reichb. f.) Summerh. of which it may prove to be a local race or variety. It may be distinguished by its smaller size, more slender inflorescences, smaller flowers and narrow perianth members including the lip. In general floral structure there is close agreement between the two species.

9. **Microcoelia Stolzii** (*Schlechter*) *Summerhayes comb. nov.*

Gussonea Stolzii Schlechter in Engler Bot. Jahrb. 53 (1915) 596, et in Fedde Repert. Spec. Nov. Beih. 68 (1932) t. 98, no. 389.

Tanganyika Territory: Kyimbila District, Madehani, Dec. 1913, *Stolz 2350* (Type); Njombe, Dec. 1931, *Lynes Ej 26;* Uluguru Mts., N.W. side, Dec. 1932, *Schlieben 3079.*

This, like *M. Smithii* (Rolfe) Summerh., is a close ally of *M. Guyoniana* (Reichb.f.) Summerh., which they appear to replace in Tanganyika Territory. *M. Stolzii* is characterised by the spur which is only about half the length of the narrow acute lip and is markedly incurved. There are, however, specimens in the Kew Herbarium from Kenya Colony in which a relatively short incurved spur is associated with the broader lip and perianth segments of typical *M. Guyoniana.* There is some evidence that these three species should more correctly be treated as variants of one species with which, perhaps, *M. conica* (Schltr.) Summerh. should also be associated.

Section II. Brachyglossa Summerhayes

Flores parvi vel mediocres; labellum pro rata breve sed saepius latum, calcari labello usque ad triplo longiore; columna antice brevis, dorso saepe valde altior, clinandrio dorso saepius valde adscendente; anthera antice sae-

pius valde producta; pollinii stipes mediocris vel longus interdum superne bifidus, viscidio ovato, oblongo vel lanceolato; rostellum longe productum, basi saepius decurvatum, parte distali interdum incurvatim porrectum.

Species typica sectionis:—*M. caespitosa* (Rolfe) Summerh.

The species of this section may be distinguished from those of Section I by their usually larger flowers and longer spur. The lamina of the lip is relatively short, though sometimes quite broad, and may be markedly concave. The column is much higher at the back than in front, the androclinium consequently rising steeply from its front margin. The rostellum is usually quite long and either produced downwards for its whole length or the lower part more or less adpressed to the column and the distal part curving upwards and forwards. In agreement with this the anther is often extended in front to form a long point covering the pollinarium. The stipes is usually long and slender while the viscidium is more elongated in shape than in sect. *Eu-microcoelia*. In several species the stipes is divided in the upper part, one pollinium being attached to each branch.

10. **Microcoelia aurantiaca** (*Schlechter*) *Summerhayes comb. nov.*

Gussonea aurantiaca Schlechter in Fedde Repert. Spec. Nov. 15 (1918) 333, et in l.c. Beih. 68 (1932) t. 96, no. 381.

Madagascar: St. Marie de Madagascar Island, or mainland nearby *Laggiara* (not seen).

On account of the column characters, particularly the sloping androclinium, the forked stipes to the pollinia and the orange color of the flowers this species seems properly placed in this section. It differs from *M. Elliotii* (Finet) Summerh. in the narrower lip, the shorter spur and the

differently shaped viscidium, and from *M. dolichorrhiza* (Schltr.) Summerh. by the absence of the two plate-like calli in front of the spur mouth, the narrower, tapering spur and the widened upper ends of the branches of the stipes.

11. **Microcoelia Bieleri** (*De Wildeman*) *Summerhayes comb. nov.*

Angraecum Bieleri De Wildeman in Bull. Jard. Bot. Brux. 5 (1916) 182.
Gussonea Bieleri Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 91.

Belgian Congo: Haut Lopori, 1904, *Bieler;* Eala, 1905, *M. Laurent 1780.*

I have not seen this species which is evidently allied to *M. caespitosa* (Rolfe) Summerh. but has larger flowers (the dorsal sepal is nearly twice as long). Unfortunately the floral details are not described sufficiently to place the species more accurately.

12. **Microcoelia caespitosa** (*Rolfe*) *Summerhayes* in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 454.
Angraecum caespitosum Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 150—Rendle Cat. Talb. Nig. Pl. (1913) 146—A. Chevalier Explor. Bot. Afr. Occ. Franç. 1 (1920) 617.
Angraecum crinale De Wildeman Not. Pl. Utiles Congo (1904) 320.
Angraecum Andersonii Rolfe in Bull. Misc. Inform. Kew (1912) 134.
Gussonea caespitosa Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 91.
Gussonea crinalis Schlechter l.c.
Gussonea micropetala Schlechter l.c. 93, *pro parte.*

Sierra Leone: Jala, Sept. 1914, *Bunting 77;* Northern Province,

Roruks, July 1936, *Deighton 3250;* Njala, June 1927, *Deighton 717.*

Liberia. Gbanga, Sept., *Linder 603.*

Ivory Coast: Between Zago and Gaouloubré, May 1907, *Chevalier 16340.* (Also several other gatherings not seen by me).

Gold Coast: No locality, *Anderson*, cult. Hort. Kew. Dec. 1911; Western Province, Tarquah, Sept.–Dec. 1912, *Miles;* Kumasi, *Cox 62*, cult. Hort. Kew. May 1937.

Southern Nigeria: Oban District, 1911, *Talbot 891.*

Cameroons: Efulen, Aug. 1895, *Bates 353* (Type); no locality, *Bates.*

Belgian Congo: Kiri, Lake Léopold II, Nov. 1903, *Laurent;* Injolo, 1906, *M. Laurent 1779, 1782;* Eala, 1905, *Pynaert 433;* same locality and date, *M. Laurent 1789.*

Evidently widely spread in western Tropical Africa. *M. micropetala* (Schltr.) Summerh. may prove to be conspecific, but the type specimen, although not well preserved, seems to have a shorter erect rostellum.

M. caespitosa may be recognised by the short inflorescences, long spur wider at both apex and base and the remarkable rostellum. This is deflexed at first and adpressed (perhaps adnate) to the column but the distal half projects forwards and upwards for an equal distance so as to be level with the anther. This upright part bears the long oblanceolate viscidium, the stipes being V-shaped to fit the rostellum and slightly widened above where the globose pollinia are attached.

13. **Microcoelia deflexicalcarata** (*De Wildeman*) *Summerhayes comb. nov.*

Angraecum deflexicalcaratum De Wildeman in Bull. Jard. Bot. Brux. 5 (1916) 185.

Gussonea deflexicalcarata Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 90.

Belgian Congo: Injolo & Eala, 1905, *M. Laurent 1776* (not seen).

Schlechter places this among the long-stemmed species but the description states "ramis brevibus usque 2 cm. longis," while in the other features I can detect no resemblance to the species of *Eu-gussonea.* The species ap-

pears to be allied to *M. caespitosa* (Rolfe) Summerh. but the perianth members are larger; the column is inadequately described.

14. **Microcoelia dolichorrhiza** (*Schlechter*) *Summerhayes comb. nov.*

Angraecum dolichorrhizum Schlechter in Ann. Mus. Col. Marseille, sér. iii, 1 (1913) 192, t. XX, figs. 8–16.
Gussonea dolichorrhiza Schlechter in Beih. Bot. Centralbl. 33, Abt. 2 (1915) 425, et l.c. 36, Abt. 2 (1918) 92, et in Fedde Repert. Spec. Nov. Beih. 33 (1925) 376, et l.c. Beih. 68 (1932) t. 97, no. 385.

MADAGASCAR: West Madagascar, Manongarivo, Ambongo, *Perrier de la Bathie* 1019 (12) (not seen).

One of the species in which the stipes is divided in the upper part. Its most striking feature is the presence of two plate-like transverse lamellae one on each side at the mouth of the spur.

15. **Microcoelia Elliotii** (*Finet*) *Summerhayes comb. nov.*

Listrostachys Elliotii Finet in Mém. Soc. Bot. France 9 (1907) 50, t. X, figs. 1–13.
Gussonea Elliotii Schlechter in Beih. Bot. Centralbl. 33, Abt. 2 (1915) 425, et l.c. 36, Abt. 2 (1918) 92.

MADAGASCAR: Fort Dauphin, June, *Scott-Elliot 2653*.

Another species with a divided stipes, which, however, in the specimen of the Type Collection at Kew, is only divided in the upper half and not almost to the base as shown in Finet's illustration. The long spur, incurved at the base and of uniform thickness throughout its entire length, is also characteristic.

16. **Microcoelia Gilpinae** (*Reichenbach filius & S. Moore*) *Summerhayes comb. nov.*

Angraecum Gilpinae Reichenbach filius & S. Moore in Journ. Linn. Soc. Lond. Bot. 16 (1877) 206.
Gussonea Gilpinae Ridley in Journ. Linn. Soc. Lond. Bot. 21 (1885) 491—Schlechter in Beih. Bot. Centralbl. 33, Abt. 2 (1915) 425, et l.c. 34, Abt. 2 (1916) 333, et l.c. 36, Abt. 2 (1918) 92, et in Fedde Repert. Spec. Nov. Beih. 33 (1925) 376.
Rhaphidorrhynchus Gilpinae Finet in Mém. Soc. Bot. France 9 (1907) 34, t. VI, figs. 33–37.

Madagascar: Antananarivo, March 1877, *Gilpin* (Type); north Madagascar, *Baron 6131;* Ambodiary, *Warpur;* Betsileoland, *Baron 199;* central Madagascar, *Baron 1082;* s.n.; Ankafana, *Deans Cowan;* no locality, *Methuen; Deans Cowan;* Imerina, *Le Myre de Vilers; Campenon* (both not seen); Maningony Forest, Sept. 1912, *Perrier de la Bathie 11379;* Manaroa River, *Perrier 11486* (both not seen).

This species may be recognised from all the other species which I have seen, with the exception of *M. melinantha* (Schltr.) Summerhayes, by the marked almost naked pedunele which is usually as long as, if not longer than, the flower-bearing part of the inflorescence. The column is also remarkable, the rostellum curving up in front so as to form in continuity with the sloping androclinium a sickle-shaped apex to the column along which lies the stipes of the pollinia. The lip is very concave and almost impossible to flatten out while the spur is incurved for a short distance at its base; it is shorter and thicker than in *M. Ellioti* (Finet) Summerh.

17. **Microcoelia konduensis** (*De Wildeman*) *Summerhayes comb. nov.*

Angraecum konduense De Wildeman Not. Pl. Utiles Congo (1904) 321.
Gussonea konduensis Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 93.

Belgian Congo: Kondue, Nov. 1903, *E. & M. Laurent* (not seen).

Described from such poorly preserved material that no

details are available of many of the floral parts. It appears to be a relative of *M. caespitosa* (Rolfe) Summerh. but may be more correctly placed in Section III.

18. **Microcoelia macrantha** (*H. Perrier*) *Summerhayes comb. nov.*

Gussonea macrantha H. Perrier in Humbert Not. Syst. 7 (1938) 29.

MADAGASCAR: Eastern region, near confluence of Rivers Onive and Mangoro, Feb. 1925, *Perrier 17028* (1) (not seen).

Easily distinguished by the relatively large flowers, the perianth lobes being about 8 mm. long.

19. **Microcoelia melinantha** (*Schlechter*) *Summerhayes comb. nov.*

Gussonea melinantha Schlechter in Fedde Repert. Spec. Nov. Beih. 33 (1925) 377.

MADAGASCAR: Central Madagascar, Mt. Zaratanana, Jan. 1923, *Perrier de la Bathie 15693* (not seen).

Said to be near *M. Gilpinae* (Reichb. f. & S. Moore) Summerh., with which it has the orange flowers and distinct peduncle in common, but the flowers appear from the description to be distinctly larger while the mouth of the spur is extremely narrow.

20. **Microcoelia micropetala** (*Schlechter*) *Summerhayes comb. nov.*

Angraecum micropetalum Schlechter in Engler Bot. Jahrb. 38 (1905) 23, fig. 6.

Gussonea micropetala Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 93.

FRENCH CAMEROONS: Dja River, Sept. 1899, *Schlechter 12779;* Oct. 1899, *Schlechter 12876;* Eko-Keyoke, in Bakossi County [N.E. of Mundame], Jan. 1900, *Schlechter 12892* (SYN-TYPES).

Very similar to *M. caespitosa* (Rolfe) Summerh., particularly as regards the perianth members and the lip, but

apparently differing in column structure. From Schlechter's drawings and my dissections of the type specimen, the rostellum does not possess the long decurved and adpressed basal portion but projects upwards from the front apex of the column; in conformity the viscidium is much shorter and there is no bend in the stipes.

Section III. Dicranotaenia (Finet) Summerhayes

Dicranotaenia Finet in Mém. Soc. Bot. France 9 (1907) 47, pro genere.

Flores mediocres; labellum pro rata magnum, ± unguiculatum, ovatum, ellipticum, suborbiculare vel subflabellatum, apice ± emarginatum apiculo interjecto, calcari longo incurvato; columna dorso alta superne ± recurvata, antice brevissima facie antica fere horizontali, clinandrio dorso valde adscendente; anthera antice longe producta; pollinii stipes longus vel perlongus, interdum superne bifidus, viscidio parvo vel minuto, saepius angusto; rostellum decurvatim productum, columnae fere omnino adnatum, apice liberum horizontaliter porrectum distincte bilobum.

Species typica sectionis:—*M. dahomeensis* (Finet) Summerh.

A small but very natural group characterised by the large lip lamina distinctly narrowed at the base, the long more or less incurved spur and the peculiar column structure. The column widens rapidly upwards from the base so that the back is nearly vertical or sloping steeply upwards while the lower part of the front is nearly horizontal and much shorter. The androclinium is nearly vertical and, with most of the rostellum, is covered by the much elongated anther. The rostellum, which extends down the front of the column, is adnate for most of its length but projects forwards at the apex to form two acute or rounded lobes in the mouth of the spur between which

rests the small and often narrow viscidium. As in some species of Section II the apex of the stipes (or of the two branches of the stipes) is not only widened but curved back to form a small flat or concave platform in the centre of which the pollinia rest.

21. **Microcoelia dahomeensis** (*Finet*) *Summerhayes* in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 454.

Dicranotaenia dahomeensis Finet in Mém. Soc. Bot. France 9 (1907) 47, t. IX, figs. 28–38.

Gussonea dahomeensis Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 92.

Gold Coast: Assuantsi, Aug. 1909, *Miles;* Akim, Bunsu Plantation, *Gillett.*

Dahomey: Adja Ouéré, *Le Testu 125* (Type not seen).

French Cameroons: No locality, *Bates 1213.*

Belgian Congo: Eala, 1925, *Robyns 531.*

Uganda: Mabira Forest, April 1908, *Brown 433.*

Evidently widely distributed throughout the forest region of equatorial Africa. This species may be recognised by the divided stipes of the pollinia and the sharply incurved spur which is swollen to form an ellipsoid sac at the apex. The lobes of the rostellum are curved slightly downwards at the very apex.

22. **Microcoelia Friesii** (*Schlechter*) *Summerhayes* in Orch. Rev. 47 (1939) 21, *in obs.*

Gussonea Friesii Schlechter in Fries Wissen. Ergebn. Schwed. Rhodes.-Kongo-Exped. 1911-12, 1 (1916) 250, fig. 26, et in Fedde Repert. Spec. Nov. Beih. 68 (1932) t. 97, no. 386.

Northern Rhodesia: Kalambo, between Abercorn and Bismarkburg, Nov. 1911, *Fries 1342.*

Unaccountably omitted from Schlechter's revision of the genus. The species may be distinguished by its broad

sub-flabellate lip and anther with not such a long point as in the other species.

23. **Microcoelia Koehleri** (*Schlechter*) *Summerhayes comb. nov.*

Angraecum Koehleri Schlechter in Engler Bot. Jahrb. 38 (1906) 162.

Gussonea Koehleri Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 93, et in Fedde Repert. Spec. Nov. Beih. 68 (1932) t. 97, no. 387.

Tanganyika Territory: Usambara, Feb. 1899, *Köhler* (not seen).

This species seems to be closely allied to *M. pachystemma* Summerh., but the rostellum lobes are linear-subulate, the viscidium broadened and obtuse in front, and in other respects the description differs from that of *M. pachystemma.*

24. **Microcoelia megalorrhiza** (*Reichenbach filius*) *Summerhayes comb. nov.*

Angraecum megalorrhizum Reichenbach filius Otia Bot. Hamburg. (1881) 117—Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 150.

Gussonea megalorrhiza Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 93.

Nyasaland: Shire River valley, Dec. 1865, *Waller* (Type); Shibisa, R. Shire, March 1859, *Kirk;* no locality, *Buchanan 1262.*

Easily distinguished by the verrucose roots. The lip lamina is narrower than in *M. pachystemma* Summerh., the rostellum lobes are more acute and the viscidium is shorter and broader.

25. **Microcoelia pachystemma** *Summerhayes* in Orch. Rev. 47 (1939) 21, fig. p. 23.

Uganda: Bulimezi, Kangape Forest, *Maitland 121 AB.*

Kenya Colony: Near Lake Victoria, March 1938, *Firth* (Type); Kisumu, Aug. 1938, *Gray 53.*

Characterised by the slightly S-shaped spur, tapering from base to apex, the very fleshy and obtuse rostellum-lobes and the linear viscidium.

Other Leafless Angraecoids

Solenangis aphylla (*Thouars*) *Summerhayes comb. nov.*

Angraecum aphyllum Thouars Fl. Iles Austr.-Afr. (1822) t. 73—Hooker Lond. Journ. Bot. 3 (1844) 482—Reichenbach filius in Walpers Ann. 6 (1864) 1907—S. Moore in Baker Fl. Maurit. Seych. (1877) 358—Reichenbach filius Otia Bot. Hamburg. (1881) 77—Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 150.

Gussonea aphylla A. Richard in Mém. Soc. Hist. Nat. Paris 4 (1828) 68 [Orch. Iles France et Bourb. 76, t. 11, fig. 1]—Ridley in Journ. Linn. Soc. Lond. Bot. 21 (1885) 492 -Schlechter in Beih. Bot. Centralbl. 33, Abt. 2 (1915) 424, et l.c. 36, Abt. 2 (1918) 90, et in Fedde Repert. Spec. Nov. Beih. 33 (1925) 374—Perrier de la Bathie in Humbert Not. Syst. 7 (1938) 31.

Saccolabium aphyllum Lindley Gen. & Sp. Orch. Pl. (1833) 223.

Mystacidium aphyllum Durand & Schinz Consp. Fl. Afr. 5 (1892) 51—Cordemoy Fl. Ile Réunion (1895) 219.

Angraecum Wakefieldii Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 146, *partim.*

Rhaphidorrhynchus aphyllus Finet in Mém. Soc. Bot. France 9 (1907) 35, t. VII, figs. 1–2.

Angraecum defoliatum Schlechter in Ann. Mus. Col. Marseille, sér. iii, 1 (1913) 191, t. XX, fig. A 1–7.

Gussonea defoliata Schlechter in Beih. Bot. Centralbl. 33, Abt. 2 (1915) 425, et l.c. 36, Abt. 2 (1918) 90, et in Fedde Repert. Spec. Nov. Beih. 33 (1925) 375, et l.c. Beih. 68 (1932) t. 96, no. 384.

Microcoelia aphylla Summerhayes in Bull. Misc. Inform. Kew (1936) 233, *in obs.*

Kenya Colony: Mombasa, *Kirk;* Mombasa, Nov. 1884, *Wakefield* (*in part*); Arabuko, *Graham 1637;* Giryama & Tsimba Mts., 1887, *Taylor.*

Tanganyika Territory: Msassaui, in fruit March 1939, *Vaughan 2765;* same locality, Sept. 1939, *Vaughan 2874.*

Mozambique: Mandera, *Sacleux 989; 1244;* Quilimane, *Le Testu 460; 823* (all not seen).

Mauritius: No locality, *Thouars; Bouton; Boivin* (not seen); around Flacq and on Montagne Longue, *Bojer* (not seen).

Reunion: R. Saint-Denis, *Cordemoy* (not seen).

Madagascar: Nosi-Komba I., Dec. 1879, *Hildebrandt 3256;* N.W. coast, *Baron 6375;* Mahanoro, *Perrier de la Bathie 14198;* Manongarivo, *Perrier 1938* (22); Fort Dauphin, *Decorse;* Nossi-Bé, *Pervillé; Boivin 2015;* no locality, *Richard* (last five not seen).

As already mentioned in my introductory remarks, I do not see how this species can be separated from *Solenangis* so far as the floral structure is concerned. In habit it has long climbing stems and short inflorescences which closely resemble those of *Solenangis clavata* (Rolfe) Schltr. The lip lamina is more strongly developed but the column and pollinia are much the same as in the leafy species of the genus. In *S. aphylla* the leaf bases are much better developed than in the other leafless species included above in *Microcoelia.*

Solenangis cornuta (*Ridley*) *Summerhayes comb. nov.*

Gussonea cornuta Ridley in Journ. Bot. Lond. 23 (1885) 310—Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 91—Perrier de la Bathie in Humbert Not. Syst. 7 (1938) 30.

Angraecum cornutum Reichenbach filius in Flora 68 (1885) 538.

Angraecum cyclochilum Schlechter in Engler Bot. Jahrb. 38 (1906) 160.

Rhaphidorrhynchus cornutus Finet in Mém. Soc. Bot. France 9 (1907) 34, t. VI, figs. 38–42.
Gussonea cyclochila Schlechter in Beih. Bot. Centralbl. 33, Abt. 2 (1915) 425, et l.c. 36, Abt. 2 (1918) 92, et in Fedde Repert. Spec. Nov. Beih. 33 (1925) 374, et l.c. Beih. 68 (1932) t. 96, no. 383.

Comoro Islands: Grand Comoro, Combani Forest, Sept. 1884, *Humblot 238* (Type).

Madagascar: Rigny Bay, *Boivin 2278;* Sainte-Marie, *Boivin 2349;* Morafenobe, *Decary 2346;* Namoroka, Ambongo, Dec. 1926, *Perrier 17829;* Marofondalia, near Morondava, Nov., *Perrier 1841;* near Antananarivo, *Bang* (all not seen).

There seems little doubt that Perrier de la Bathie is correct in considering *Gussonea cornuta* Ridl. and *Angraecum cylochilum* Schltr. to be conspecific. *S. cornuta* differs from *S. aphylla* (Thouars) Summerh. in the fewer-flowered inflorescences, the more or less orbicular lip lamina retuse at the apex, the spur tapering towards the apex, the more acute rostellum lobes and the longer stipes to the pollinia. In general features it conforms well with the genus *Solenangis* except that the lip lamina is better developed. The four species *S. clavata* (Rolfe) Schltr., *S. scandens* (Schltr.) Schltr., *S. aphylla* (Thouars) Summerh. and *S. cornuta* (Ridl.) Summerh. form a series in which the lip lamina is progressively well developed in comparison with the uniformly large spur.

Encheiridion *Summerhayes gen. nov.*

Epiphytica, aphylla. *Caulis* brevissimus, radices numerosas simplices flexuosas emittens, apice cataphyllis imbricantibus subcartilagineis obtectus. *Inflorescentiae* ex axillis cataphyllorum ortae, simpliciter racemosae, multiflorae; pedunculus brevis; bracteae brevissimae, vaginantes. *Flores* alternati, parvuli, breviter pedicellati. *Sepala* et *petala* vix patentia, lateralia obliqua, petalis quam sepalis paulo latioribus. *Labellum* trilobatum; lobi

laterales parvi, erecti, acuti; lobus intermedius multo major, ex ungue brevi transverse elliptico-oblongus, apice late retusus apiculo interjecto, marginibus breviter laceratis; calcar basi dependens, triente apicali valde incurvatum, apice valde inflatum. *Columna* brevis, apice truncata sed dorso in apiculum producta, androclinio fere horizontali; anthera hemisphaerica, antice in rostrum triangulare breve producta; pollinia globosa, stipite uno perlongo angustissimo apice valde dilatato, viscidio linear-ligulato stipite multo breviore: rostellum horizontale, ornithorrhynchum, columna duplo vel triplo longius, marginibus recurvatis, viscidio amoto apice per 1.5 mm. longo bipartitum.

Species unica:—*E. macrorrhynchium* (Schltr.) Summerh.

Encheiridion macrorrhynchium (*Schlechter*) *Summerhayes comb. nov.*

Angraecum macrorrhynchium Schlechter in Engler Bot. Jahrb. 38 (1905) 22.

Gussonea macrorrhynchia Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 93, et in Fedde Repert. Spec. Nov. Beih. 68 (1932) t. 97, no. 388.

Microcoelia macrorrhynchia Summerhayes in Hutchinson & Dalziel Fl. West. Trop. Afr. 2 (1936) 454.

Gold Coast: Pamu Berekum, Sept. 1932, *Vigne 2490.*

French Cameroons: Dja R., Oct. 1899, *Schlechter 12785* (not seen) (Type); Ja River, Bitye, near the Ndu River, Sept. 1918, *Bates 1429.*

Gabon: Upper Ogoué River, Tomisimba, May 1931, *Le Testu 8801.*

The above remarkable plant must, in my opinion, be removed from *Microcoelia* and form a new genus. The characteristic features are the curiously shaped trilobed lip and the column structure, particularly the long horizontal rostellum which is two to three times as long as the column. There is some doubt as to the exact interpretation of the lip structure. Schlechter treats the two

upright triangular structures, one on each side of the spur opening, as two parts of a bifid callus and as the base of the front lobe is decurrent around the outside of these, there is some justification for this view. The "side lobes," however, are quite separate from one another and in his view should be treated as two calli, comparable to those in such diverse genera as *Eulophia* and *Diplacorchis*. I have described recently (in Bot. Mus. Leafl. Harv. Univ. 10 (1942) 286) a *Polystachya* in which the true lateral lobes are decurrent in front on to the middle lobe so that the structures in *Encheiridion macrorrhynchium* may be homologous with those in this *Polystachya*. In support of this we have the fact that paired calli are extremely uncommon in the Angraecoid orchids, although they are recorded for *Microcoelia dolichorrhiza* (Schltr.) Summerh. In that case they are transversely placed and there is no other resemblance between that species and the species under discussion.

In column structure the species is far removed from any *Microcoelia*. The androclinium is almost horizontal and in that respect agrees with that in sect. *Eu-microcoelia* of that genus, but the long rostellum is very distinct. This bears at its apex a narrow viscidium about 1.5 mm. long which is apparently more or less continuous with the stipes and not markedly articulated with it as in most Angraecoids. The anther is only shortly produced in front and does not cover the whole of the stipes as in most *Microcoelias*.

Chauliodon *Summerhayes gen. nov.*

Epiphytica, aphylla. *Caulis* brevis vel brevissimus, radices numerosas simplices vel pauciramosas flexuosas emittens, apice cataphyllis acuminatis praeditus. *Inflorescentiae* ex axillis cataphyllorum ortae, simpliciter racemosae, laxiusculae multiflorae; bracteae parvae, vaginantes.

Flores alternati, mediocres, longiuscule pedicellati. *Sepala* obovato-oblonga, lateralia valde obliqua. *Petala* quam sepala breviora et angustiora. *Labellum* ad calcar fere omnino redactum; lamina minuta, dentiformis, leviter recurvata, ante calcar callo erecto dentiformi acuto instructa; calcar basi valde inflatum, medio anguste cylindricum, dimidio vel triente apicali subito inflexum leviter inflatum. *Columna* inferne inclinata, superne recurvata, apice dilatata; androclinium dorso adscendens; anthera cucullata, antice longe et acute rostrata; pollinia ellipsoidea, infra apicem stipitis affixa, stipite inferne gracili superne valde dilatato pollinia fere amplectente, viscidio parvo triangulari secus medium convexo dorso truncato; rostellum ± deflexum, modice productum, acutum vel obtusum, viscidio amoto breviter bifidum.

Species unica:—*C. Buntingii* Summerh.

Chauliodon Buntingii *Summerhayes sp. nov.*

Planta epiphytica, aphylla; caulis usque ad 2.5 cm. longus, circiter 0.3 mm. diametro, radices simplices vel pauciramosas flexuosas sulcatas laeves 1–1.5 mm. diametro emittens, cataphyllis lanceolatis acutis vel acuminatis subcartilagineis instructus. *Inflorescentiae* graciles, usque ad 25 cm. longae, basi vaginis aretis circumdatae, inferne vaginis aretis distantibus instructae, superne laxe vel laxiuscule multiflorae; rhachis teres, laevis; bracteae vaginantes, acutae, usque ad 3 mm. longae. *Flores* erecto-patentes, brunneo-rosei; pedicellus (ovario incluso) 2–3 mm. supra internodium exortus, fere filiformis, 10–13 mm. longus. *Sepalum* intermedium obovato-oblongum, apiculatum, concavum, 3.5–4.5 mm. longum, 1.75–2.25 mm. latum, trinervium; sepala lateralia dimidio inferiore recta, oblonga, dimidio superiore valde obliqua, ovata, apiculata, latere antico dilatata, circiter 5 mm. longa et 2.5 mm. lata, trinervia. *Petala* oblique lanceolata, acu-

minata, 3–4 mm. longa, circiter 1 mm. lata, uninervia. *Labellum* fere ad calcar redactum; lamina minuta, recurvata, dentiformis, circiter 0.5 mm. longa, ante calcar callo erecto dentiformi acuto antice anguste alato postice sectione V-formi circiter 2 mm. alto instructa; calcar pro rata magnum, triente basali valde inflatum ore 3.3 mm. latum, triente intermedia anguste cylindricum, tum subito incurvatum angustatum, triente apicali leviter adscendente modice inflatum, apice ipso leviter recurvatum, subobtusum, in toto 12–14 mm. longum. *Columna* inferne inclinata, superne recurvata, circiter 3 mm. alta; androclinium dorso adscendens, excavatum; anthera cucullata, antice sensim angustata, longiuscule rostrata, apice ipso breviter recurvata, 3.3 mm. longa; pollinia ellipsoidea, 0.8–1 mm. longa, 0.6–0.8 mm. infra apicem stipitis inserta, stipite dimidio inferiore angusto superne valde dilatato pollinia fere amplectente circiter 3 mm. longo, viscidio minuto triangulari antice subacuto postice truncato secus medium convexo, 0.2 mm. longo; rostellum decurvatum, modice productum, acutum vel obtusum, apice ipso leviter adscendens, viscidio amoto breviter bifidum.

Liberia: Mt. Barclay, June 1912, *Bunting 9* (Type in Herb. Mus. Brit.).

Southern Nigeria: Eket District, 1912–13, *Talbot 3287*.

This very remarkable plant was unfortunately overlooked when the Flora of West Tropical Africa was prepared. The general organisation indicates a relationship to *Microcoelia* Lindl., especially the leafless habit, very short stems, adnation of the base of the pedicel to the rhachis, column structure and common stipes to the pollinium. The distinctive features are the lip lamina reduced to a tooth-like point and the tall erect acute callus placed just in front of the spur mouth; the generic name is given in allusion to this. This callus is keeled on the outside and hollow towards the column the two sides

diverging and making the callus V-shaped in transverse section. The stipes of the pollinarium is broadened in the upper half to form a flattened plate which is wrapped around the greater part of the pollinia; these arise some distance below the apex on a slightly less sloping or horizontal portion of the widened area. These features are developed to a much less extent in some of the species of the section *Dieranotaenia* of *Microcoelia*.

Taeniorrhiza *Summerhayes gen. nov.*

Epiphytica, aphylla. *Caulis* brevissimus, radices paucas compressas (vel late bialatas) taeniolis similes emittens, apice cataphyllis longe caudato-acuminatis praeditus. *Inflorescentiae* ex axillis cataphyllorum ortae, uniflorae; pedunculus brevis, apice bracteis duabus instructus. *Flores* pro rata magni, modice pedicellati. *Sepala* ovato-lanceolata, lateralia majora et obliqua. *Petala* curvatim lanceolato-ligulata, ut sepala ± patentia. *Labellum* e basi angusta subito dilatatum, orbiculari-ovatum, apice retusum, ecallosum sed nervis valde incrassatis; calcar leviter recurvatum vel fere rectum ex ore latiusculo usque ad apicem sensim attenuatum, postice cum lateribus columnae pedi adnatum. *Columna* inclinata, apice truncata, pede brevi instructa, superne semiteres, marginibus inferne alatis in calcar decurrentibus; androclinium anguste excavatum, dorso adscendens; anthera non visa; pollinia oblique ellipsoidea, infra stipitis apicem affixa, stipite uno inferne tereti superne valde dilatato ± oblique cupulari pollinia fere amplectente, viscidio carnoso ovato; rostellum porrectum, triangulare, acutum, viscidio amoto fere omnino bifidum; fovea stigmatica fere orbicularis.

Species unica:—*T. gabonensis* Summerh.

Taeniorrhiza gabonensis *Summerhayes sp. nov.*

Planta epiphytica, humilis, aphylla; caulis brevissimus, usque ad 2 cm. longus, 3–5 mm. diametro, radices paucas

flexuosas simplices vel pauciramosas carnosas compressas vel late bialatas taeniolis similes virides usque ad 40 cm. longas 6–9 mm. latas emittens, apice cataphyllis e basi lanceolata longe caudato-acuminatis recurvatis subcartilagineis 5–8 mm. longis praeditus. *Inflorescentiae* breves, uniflorae; pedunculus teres, crassiusculus, circiter 1 cm. longus, basi vaginis acutis arcte imbricantibus, apice bracteis duabus inferiore sterili longe acuminatis instructus. *Flores* brunnei; pedicellus cum ovario circiter 2.25 cm. longus, bracteam multo superans. *Sepalum* intermedium lanceolato-ovatum, apice breviter acuminatum et cucullatum, 13 mm. longum, 8–8.5 mm. latum; sepala lateralia quam intermedium fere duplo majora, oblique lanceolato-ovata, breviter acuminato-apiculata, margine antica inferne valde dilatata, circiter 17 mm. longa et 9.5 mm. lata; omnia sepala trinervia, nervis exterioribus ramosis. *Petala* oblique vel fere sinuatim lanceolato-ligulata, acuta, circiter 14 mm. longa, 3.5–4 mm. lata, trinervia. *Labellum* e basi angustata fere unguiculata subito dilatatum, suborbiculari-ovatum, apice retusum apiculo interjecto, marginibus sinuato-suberenatis, circiter 18 mm. longum et 19.25 mm. latum, ecallosum sed nervis ramosis incrassatis; calcar leviter recurvatum vel fere rectum, ex ore circiter 4.5 mm. diametro sensim angustatum, apice subacutum, postice basi columnae pedi adnatum. *Columna* inclinata, apice truncata, 6 mm. alta, sectione semi-tereti, marginibus inferne alatis in pedem 4.5 mm. longum productis calcari adnatis; androclinium dorso adscendens; anthera non visa; pollinia oblique ellipsoidea, 1.5 mm. longa, 1.2 mm. infra stipitis apicem affixa; stipes trientibus duobus inferioribus teres, triente apicali valde dilatatus, fere cupularis postice cupulae margine humiliore, pollinia fere amplectens, in toto 4.7 mm. longus, superne 2.75 mm. latus; viscidium ovatum, carnosum, 1.8 mm. longum, 1.4 mm. latum. subtus excavatum; rostel-

lum porrectum, triangulare, acutum, 2 mm. longum, viscidio amoto fere ommino bifidum: fovea stigmatica fere orbicularis.

Gabon: Upper Ngounyé River, Mourindou, Oct. 1926, *Le Testu 6357* (Type in Herb. Le Testu).

This remarkable plant stands alone among African orchids in its flattened green roots, similar to those in *Phalaenopsis*, *Kingiella* and other Asiatic genera. Other distinctive features are the single-flowered inflorescences, the striking lip and the column structure. The lip, with its numerous thickened branching veins is more reminiscent of certain species of *Eulophia* than of an Angraecoid and this resemblance is carried further in the marked column foot. The sides of the column are carried down in the form of wings onto the foot where they are joined to the margins of the spur opening. The lateral sepals also arise on the foot. The pollinarium shows certain features in common with that of *Chauliodon*, described above, but here the flattened apical part of the stipes forms a shallow cup, with a low break in the rim on the posticous side, but almost completely enveloping the pollinia which are attached toward the base of the cup. The viscidium is massive and fleshy and fits under the triangular rostellum.

Ankylocheilos *Summerhayes gen. nov.*

Epiphytica, aphylla. *Caulis* brevissimus, radices flexuosas simplices emittens. *Inflorescentiae* erectae, superne pauciflorae; bracteae minutae. *Flores* minuti, patentes, breviter pedicellati. *Sepala* et *petala* usque ad supra medium connata, inter se similia, parte libera lanceolata ovata, subacuta. *Labellum* liberum, ambitu lanceolatum, superne profunde cucullatum, apice ipso inflexum acutissimum, basi utrinque dilatatum, obscure trilobatum; calcar fere globosum, ore antice callo carnoso fere occlusum. *Columna* brevissima, truncata, antice utrinque lobo ellip-

tico porrecto instructa; androclinium excavatum; anthera ± quadriloba, lobis hemisphaericis duobus posticis quam anticis plus duplo majoribus: pollinia oblique pyriformia, stipite brevissimo, viscidio fere semiorbiculari.

Species unica:—*A. Coxii* Summerh.

Ankylocheilos Coxii *Summerhayes sp. nov.*

Planta epiphytica, minuta, aphylla. *Caulis* brevissimus, usque ad 0.5 cm. longus, radices flexuosas teretes laeves usque ad 4 cm. longas, 1 mm. diametro emittens. *Inflorescentiae* erectae, usque ad 1.5 cm. altae, dimidio superiore subdense 3–6-florae; pedunculus gracilis, teres; bracteae ovatae, obtusae, circiter 0.5 mm. longae. *Flores* patentes, aurantiaci, breviter pedicellati. *Sepala* et *petala* subsimilia, sed lateralia leviter obliqua, e basi usque ad supra medium inter se connata, in toto circiter 1.5 mm. longa et 0.5 mm. lata; sepali pars libera lanceolata, obtusa, apice leviter recurvata; petali pars libera triangulari-ovata, subacuta; omnia tepala uninervia. *Labellum* liberum e basi dilatata et obscure trilobata ambitu lanceolatum, acutum, superne propter margines ad medium inflexas connatas longe (vel profunde) cucullatum, apice inflexo acutissimo; calcar fere globosum, 0.6 mm. diametro et longum, ore antice callo carnoso semilunato fere occlusum. *Columna* brevissima, 0.4 mm. alta, truncata, antice utrinque lobo elliptico (?stelidio) porrecto 0.4 mm. longo instructa; androclinium excavatum, reclinatum; anthera opercularis, ± quadriloba, lobis hemisphaericis duobis anticis minoribus leviter cucullatis; pollinia 0.25 mm. longa, stipite brevissimo crasso columnari, viscidio fere semiorbiculari antice rotundato postice latissime cuneato 0.2 mm. lato; rostellum breviter productum, obtusum.

Gold Coast: Aburi, April 1938, *Cox 92*.

Described from five specimens in liquid preservative.

The specific epithet is given in honor of the collector, Mr. J. K. Cox, of the Gold Coast Department of Agriculture, who has paid special attention to the orchids of that colony and has made several other interesting discoveries. The whole plant is only a few centimetres long and high and could easily be overlooked.

This remarkable species, although possessing the habit of the smaller species of *Microcoelia* has several very distinctive features, among which are the unition of the tepals, the extraordinary lip and the structure of the column. No Angraecoid orchid has previously been recorded in which the tepals are united to form a tube as in the plant here considered. The lip is reminiscent of that of *Liparis tridens* Kraenzl., but in *A. Coxii* the inflexed margins are actually connate so as to form a deep narrow hood rather like the finger of a glove; the apex is incurved to form a sharp slender hook, hence the generic name. At the mouth of the spur there is a platform-like semilunate callus which projects inwards so as to leave only a very small opening against the column front. The very short column bears at its front corners two flap-like lobes projecting forwards in a vertical plane. Between these is the obtuse rostellum bearing the relatively large viscidium from the centre of which arises the short massive stipes. The anther has two erect rounded posticous lobes, each one containing the greater part of a pollinium, while in front there are two similar but smaller lobes between which is a slit through which the pollinia are attached to the stipes. The whole structure is so minute that it was only with difficulty that the details could be elucidated.

NOMENCLATORIAL NOTE ON A SOUTH AMERICAN ORCHID

BY

CHARLES SCHWEINFURTH

The following note is the result of intensive studies on the orchid flora of Peru.

Batemannia Colleyi *Lindley* in Bot. Reg. 20 (1834) t. 1714—W.J. Hooker in Bot. Mag. 67 (1840) t. 3818—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 473, t. 94, fig. 1.

Lycaste Colleyi Hort. ex J.E. Planchon Hort. Donat. (1855) 16.

Maxillaria Colleyi Hort. ex J. E. Planchon Hort. Donat. (1855) 16.

Petronia regia Rodrigues Gen. et Sp. Orch. Nov. 1 (1877) 107.

Batemania Petronia Rodrigues in Vellosia ed. 2, 1 (1891) 131.

Batemania peruviana Rolfe in Kew Bull. (1895) 193.

Except for *Batemania peruviana*, all of the foregoing concepts have already been reduced to *B. Colleyi*.

On the evidence of a photograph of the type of *Batemania peruviana*, together with the description, it is apparent that this concept is also reducible to *B. Colleyi* as beautifully delineated in the Botanical Register, t. 1714. There is in general no morphological difference between these concepts. *B. Colleyi* is described and shown as having oblong-spatulate lateral sepals, whereas these parts are oblong in *B. peruviana*. However, this "spatulate" appearance in the case of *B. Colleyi* is undoubtedly due to the subconduplicate lower portion of the lateral sepals—a character which is also ascribed to *B.*

peruviana. Moreover, the several collections of ***B. Colleyi*** in the Ames Herbarium from British Guiana (the type locality of that species) and from nearby Trinidad show lateral sepals which are truly oblong and not in any sense spatulate when expanded. Furthermore, the alleged color of the flowers appears to be very similar in the two concepts.

Considerable variation in size of the floral segments is shown by specimens of *Batemannia Colleyi* from British Guiana, Trinidad and Brazil. Indeed recent collections from Peru exhibit even larger flowers which are often more fleshy in consistency. One Peruvian collection, ***Klug 1441***, has somewhat narrower petals than usual and approximates the form depicted in the Botanical Magazine t. 3818.

Since the original spelling of the genus is Batemannia, it is in the spirit of modern practice to conserve this spelling, even considering the fact that the spelling Batemania was pointed out as orthographically preferable by Endlicher in 1836.

This species appears to be rather widespread throughout northern South America, having been recorded from British Guiana (type), Trinidad, Brazil and Peru.

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NOTES ON TROPICAL AMERICAN ORCHIDS

BY

CHARLES SCHWEINFURTH

AS A RESULT OF studies on the orchids of the American tropics, the following nomenclatorial notes, comments, amplifications and new varieties have been deemed advisable.

Fuertesiella pterichoides *Schlechter* in Urban Symb. Antill. 7 (1913) 493.

Cranichis grandiflora Ames & Schweinfurth in Sched. Orch. 8 (1925) 8, fig. 2.

Fuertesiella grandiflora Schlechter in Fedde Repert. 21 (1925) 331.

A careful comparison of the type collection of *Cranichis grandiflora* with an isotype collection of *Fuertesiella pterichoides* shows that the two species are synonymous.

In this collection of *Fuertesiella pterichoides*, one plant which is considerably taller than *Cranichis grandiflora* has a leaf about 3.7 cm. long with a petiole about 4.5 cm. long, while another plant which is but slightly taller than *C. grandiflora* has a leaf about 2.3 cm. long with a petiole about 1.7 cm. long. *C. grandiflora* has a leaf almost mid-way between these extremes, the lamina being about 3 cm. long with the petiole about 1.5 cm. long.

The flowers of *Cranichis grandiflora* appear to be slightly larger than those of *Fuertesiella pterichoides*.

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A variation in the shape of the leaf of this concept, which is commonly ovate or ovate-cordate, appears in a recently examined Cuban collection (*Brother Hioram 7615*) in which the lamina is narrowly elliptic with a cuneate base and is nearly 5 cm. long and 1.4 cm. wide.

Fuertesiella pterichoides has been reported only from Santo Domingo, while *Cranichis grandiflora* originates in Oriente Province, Cuba.

Ponthieva diptera *Linden & Reichenbach filius* in Bonpl. 2 (1854) 278.

Ponthieva dicliptera Reichenbach filius in Flora 69 (1886) 548.

Ponthieva elata Schlechter in Fedde Repert. Beih. 7 (1920) 63; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 20, nr. 73.

The type description of *Ponthieva dicliptera* appears to agree well with isotype material of *P. diptera* and with a drawing from the Reichenbach Herbarium at Vienna. Reichenbach states that *P. diptera* has two calli near the apex of the lip instead of one, thus differing from *P. dicliptera*. However, both the drawing of typical *P. diptera* and several collections referred to that species show a single retuse callus.

The concept *Ponthieva elata* seems to be only a vegetatively larger form of *P. diptera*, which, despite Schlechter's assertion to the contrary, has petals very like those of *P. diptera*.

This species, which was originally recorded from Colombia, has been found in Cuba and lately in Peru.

Pleurothallis Dinotherii *Reichenbach filius & Warscewicz* in Bonpl. 2 (1854) 114, non *P. Dinotherii* Reichenbach filius sensu Lindley Fol. Orch. Pleurothallis (1859) 32, no. 191.

Pleurothallis diptera Lindley Fol. Orch. Pleurothallis (1859) 44, no. 279.
Humboldtia Dinotherii O. Kuntze Rev. Gen. Pl. 2 (1891) 667.
Humboldtia diptera O. Kuntze Rev. Gen. Pl. 2 (1891) 667.
Pleurothallis tricaudata Schlechter in Fedde Repert. Beih. 9 (1921) 77; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 115, nr. 451.

Judging by the type description of *P. Dinotherii* together with records of that species from the Reichenbach Herbarium in Vienna, it would seem that the description of *P. Dinotherii* given by Lindley (l.c.) represents a different concept. Lindley's material apparently had broader sepals and a dissimilar lip.

As represented by a photograph of the type, *Pleurothallis diptera* differs from *P. Dinotherii* in the smaller size of the leaves and the possibly greater length of the sepals. The latter organs are of precisely the same form in the two concepts. The lateral sepals, however, are described and figured as deflexed in *P. Dinotherii*, while in *P. diptera* some of the lateral sepals are only slightly decurved. In the absence of definite or striking morphological characters, however, all attempts to separate *P. diptera* from *P. Dinotherii* satisfactorily seem futile.

Dr. Kränzlin originally referred to *Pleurothallis diptera* the collection (*Weberbauer 6827*) which was later made by Schlechter the type of *P. tricaudata*. After examining material of this Weberbauer number which was seen by both Kränzlin and Schlechter, I am convinced that Kränzlin was correct in referring the collection to *P. diptera*. Indeed, the only discrepancies between the two concepts is that the flowers of the Weberbauer collection have a lip which is broadly cuneate, rather than subcordate, below.

Pleurothallis divaricans *Schlechter* in Fedde Repert. 10 (1912) 387; ex Mansfeld in Fedde Repert. Beih. 58 (1930) t. 30, nr. 120.

In several collections from Peru which are certainly referable to this species, some discrepancies from the original description and floral analysis are noted. The stems (described as 4–7 cm. long) range from 3.5 to 10 cm. long; the elliptic-lanceolate mature leaves (normally much longer) are occasionally only 3.5 cm. long; the inflorescences (described as little shorter than the leaves) often more or less surpass the leaves; the petals are oblong-oblanceolate or oblong-spatulate and more or less acute (rather than oblong-ligulate and obtuse); and the lip when expanded is rhombic-obovate and abruptly narrowed above to an acute or apiculate apex (not suborbicular).

All of these collections came from near the type locality at altitudes ranging from 1200 to 1700 meters.

Pleurothallis macrorhiza *Lindley* in Hooker Journ. Bot. 1 (1834) 9: Fol. Orch. Pleurothallis (1859) 43, no. 273.

Humboldtia macrorhiza O. Kuntze Rev. Gen. Pl. 2 (1891) 667.

? *Pleurothallis Millei* Schlechter in Fedde Repert. 15 (1917) 52, non Schlechter in Fedde Repert. 14 (1915) 131.

Pleurothallis rhizomatosa Schlechter in Fedde Repert. Beih. 8 (1921) 62; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 84, nr. 327.

Judging by the description (without any actual record), it appears very probable that the concept described as *Pleurothallis Millei* by Schlechter in 1917 is referable to *P. macrorhiza*. It seems to differ, however, in having narrower leaves and somewhat smaller flowers.

The concept *P. rhizomatosa* (of which I have seen isotype material) is surely referable to *P. macrorhiza*, of which we have a record of the type. Its flowers appear to be of about the same size, and its petals are oblong-cuneate like those of *P. macrorhiza* rather than obovate-spatulate as described and figured for *P. rhizomatosa*.

A Peruvian collection (*Macbride & Featherstone 2455*) is also referable to *P. macrorhiza*, but has larger (especially broader) leaves and the obovate-spatulate petals described and figured for *P. rhizomatosa*.

This species, described from and probably rather frequent in Ecuador, is now recorded from Peru.

Pleurothallis semipellucida *Reichenbach filius* in Linnaea 22 (1849) 823—Lindley Fol. Orch. Pleurothallis (1859) 7, no. 27.

Humboldtia semipellucida O. Kuntze Rev. Gen. Pl. 2 (1891) 668.

Pleurothallis complicata Rolfe in Mem. Torr. Bot. Club 6 (1896) 121.

An examination of isotype material of *Pleurothallis complicata* shows that it should not be separated from *P. semipellucida*. The single noteworthy difference is that typical *P. semipellucida* has petals which are distinctly clavate and more or less obtuse at the much-thickened apex (although they vary in degree even in a single collection), while those of *P. complicata* are linear and but very slightly broadened above.

A large series of Peruvian collections referable to *P. semipellucida* shows a range of petals varying from conspicuously clavate and much-thickened to linear and scarcely dilated or thickened above.

This species, described from Venezuela, occurs in Trinidad, appears to be frequent and widely distributed in Peru, and extends to Bolivia (as *P. complicata*).

Pleurothallis xanthochlora *Reichenbach filius* in Linnaea 22 (1849) 823 —Lindley Fol. Orch. Pleurothallis (1859) 7, no. 26.

Humboldtia xanthochlora O. Kuntze Rev. Gen. Pl. 2 (1891) 668.

Pleurothallis huamucoensis Schlechter in Fedde Repert. Beih. 9 (1921) 75; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 114, nr. 448.

It seems to me that *Pleurothallis huamucoensis* cannot be separated from *P. xanthochlora*. The only significant difference between these concepts is that *P. huamucoensis* has erect racemes of white flowers, whereas *P. xanthochlora* has divaricate racemes of greenish yellow flowers.

The lip of *P. xanthochlora* appears to vary from having a distinct lateral tooth on each side to being subentire or even entire in outline. Peruvian collections referable to this species have flowers ranging from greenish white to pale yellow.

Although the type of *P. xanthochlora* was described from Venezuela, several Peruvian collections have since been made.

Diothonea gratissima *Reichenbach filius* in Bot. Zeit. 10 (1852) 772, *ampl. C. Schweinfurth.*

Unfortunately, this species was so inadequately described that it is impossible to gain a definite conception of it from the original source alone and no subsequent amplification has appeared. In the Ames Herbarium, however, there are records from the Reichenbach Herbarium in Vienna which undoubtedly represent the type of *D. gratissima;* and these, except for slight discrepancies in some of the lips give a fairly definite idea of a concept which has been widely referred to in literature. For purposes of clarification, therefore, I herewith give the following amplified description.

Stems stout, often much branched, entirely concealed by loose cylindric leaf-sheaths. Leaves numerous, distichous, spreading, oblong-linear, abruptly bilobulate at the apex, up to 6 cm. long. Inflorescence terminal, racemose, more or less recurved, several-flowered. Flowers campanulate. Dorsal sepal ovate, acute. Lateral sepals obliquely ovate-lanceolate, long-acuminate. Petals lanceolate-ovate, acute or acuminate. Lip round-obovate, more or less lobed in front, retuse at the apex, commonly biauriculate and more or less cuneate at the concave base. Column short, curved, with the lateral wings adnate below to the base of the lip.

In the original description no hint as to the source of the plant is given. The words, "Leipzig, in Mauricianum," which are cited, seem to imply that the species was described from a garden specimen. We have a record (as stated above) of a dried plant together with floral analyses labelled *Diothonea gratissima* from the Reichenbach Herbarium in Vienna. Yet, Schlechter (in Fedde Repert. Beih. 8 (1921) 66) says "Das Original der *D. gratissima* Rchb.f. befindet sich im Dahlem-Herbar. Es ist von Humboldt und Bompland auf dem Quindiu-Passe in Colombia gesammelt."

Diothonea nutans (*Lindl.*) *C. Schweinfurth comb. nov.*

Hemisleria nutans Lindley Fol. Orch. Hemisleria (1853), p. 1.

Epidendrum Hemisleria Reichenbach filius in Walpers Ann. 6 (1862) 383.

Epidendrum rhopalorhachis Kränzlin in Fedde Repert. 1 (1905) 180.

Following Bentham & Hooker f. (Gen. Pl. 3 (1883) 523), it seems to me that the concept forming the monotypic genus Hemisleria should be included in Diothonea.

Therefore, the new combination *Diothonea nutans* is proposed.

The concept, *Epidendrum rhopalorhachis*, has already been referred to *Hemiseleria nutans* (Schlechter in Fedde Repert. Beih. 9 (1921) 145).

As far as known, this species is restricted to Peru.

Laelia moyobambae (*Schltr.*) *C. Schweinfurth comb. nov.*

Schomburgkia Moyobambae Schlechter in Fedde Repert. Beih. 9 (1921) 97; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 123, nr. 482.

In accordance with the recently suggested policy of including the concept Schomburgkia (1838) in the older genus Laelia (1831)[1], I hereby make the necessary transfers of this and the following Peruvian species:

Laelia Weberbaueriana (*Kränzl.*) *C. Schweinfurth comb. nov.*

Schomburgkia Weberbaueriana Kränzlin in Engler Bot. Jahrb. 37 (1906) 527.

Scaphyglottis Antonii *Schlechter* in Fedde Repert. Beih. 9 (1921) 78; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 115, nr. 453.

Scaphyglottis loretoensis Schlechter in Fedde Repert. Beih. 9 (1921) 79 (as *loretorensis*); ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 116, nr. 454.

Judging by a careful comparison of the type descriptions of these two concepts, the only difference between them lies in vegetative size. Whereas *Scaphyglottis Antonii* is described as being 25–35 cm. tall with slender-cylindric stems up to 18 cm. long, *S. loretoensis* is cited

[1] L. O. Williams in Darwiniana 5 (1941) 74.

as being 8–12 cm. tall with narrowly fusiform stems up to 4 cm. long. The leaves of the two forms appear to be closely similar and the flowers are nearly identical.

However, a Peruvian collection (*Killip & Smith 23625*) which I refer to *S. Antonii*, consists of one small plant which is a good match for *S. loretoensis* (only with slender stems), together with other plants which are about 35 cm. high as in *S. Antonii*. The flowers of these plants are inseparable.

Judging by the frequent conspicuous degree of variation in the vegetative proportions shown by plants of a single species in Scaphyglottis, it seems to be the wise course to consider *S. loretoensis* as merely a small form of *S. Antonii*.

Scaphyglottis cuneata *Schlechter* in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 398.

Isochilus prolifer R. Br. in Aiton Hort. Kew. ed. 2, pt. 5 (1813) 209, excl. synon.—Lindley in Bot. Reg. 10 (1824) t. 825, nec Epidendrum proliferum Sw., nec Cymbidium proliferum Sw.
Isochilus proliferum Lindley Gen. & Sp. Orch. Pl. (1831) 113, excl. synon. in part.
Scaphyglottis prolifera Cogniaux in Martius Fl. Bras. 3, pt. 5 (1898) 15.
Tetragamestus gracilis Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 400.
Scaphyglottis Werckleі Schlechter in Fedde Repert. Beih. 19 (1923) 28.
Scaphyglottis gracilis Schlechter in Fedde Repert. Beih. 19 (1923) 28.
Ponera mapiriensis Kränzlin in Fedde Repert. 25 (1928) 22.
Scaphyglottis Werckleі Schltr. var. *major* C. Schweinfurth in Bot. Mus. Leafl. Harv. Univ. 4 (1937) 117.

The widespread species known as *Scaphyglottis prolifera*, illustrated by Lindley (as *Isochilus prolifer*, l. c.) is an entirely different plant from *Epidendrum proliferum* Sw., upon which it was erroneously based. This concept, consequently, must have a new name. The next oldest designation not founded on *Epidendrum proliferum* is selected, namely *S. cuneata*.

Except for *Scaphyglottis Wercklei* and its variety, the above names have already been reduced to synonymy (Correll in Bot. Mus. Leafl. Harv. Univ. 9 (1941) 148).

Scaphyglottis Wercklei differs from the typical form of *S. cuneata* only in lacking a callus on the lip. This structure, however, seems to be extremely variable when it is present and may be quite inconspicuous or lacking in certain collections. It seems advisable, therefore, to relegate both this concept, and its variety, to the polymorphic *S. cuneata*.

This species occurs throughout Central America from Guatemala and British Honduras to Panama; in Grenada and Trinidad; and in Colombia, Venezuela, British Guiana, Surinam, Brazil, Bolivia and Peru.

Scaphyglottis Huebneri *Schlechter* in Beih. Bot. Centralbl. 42, Abt. 2 (1925) 95.

A number of collections from eastern Peru (Departments of Junín and Loreto) have been referred to this species. Altogether they show marked variation in vegetative size and in floral details, and accordingly it seems advisable to add a few supplementary notes to the original description.

The lower part of the stems (even of the abbreviated superposed members) is clothed by several loose imbricating scarious evanescent sheaths, of which the upper ones are articulated to short blades. The leaves, which are gradually narrowed toward the apex, reach a length

of 24 cm. and vary in width from 3 to 7 mm. The flowers seem to be invariably somewhat larger than those described. The sepals are about 5.5 mm. or less in length. The petals, which are only slightly shorter than the sepals, are nearly always sharply acute or apiculate. The lip, which is about as long as the sepals, has a mid-lobe which is commonly semiorbicular to ovate and is always more or less sharply acute. The color of the flowers ranges from greenish or whitish to pale yellow often tinged with pink or pale lilac. The altitude of the habitat ranges from 100 to 1300 meters.

Orleanesia yauaperyensis *Rodrigues* in Vellosia ed. 2, pt. 1 (1891) 124—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1898) 6, t. 3, fig. 1.

There has recently come to hand a single Peruvian plant which seems to be referable to the above Brazilian species. It differs from the diagnosis of the type, however, in having eight leaves, instead of four, the blades being somewhat larger (up to 13 cm. long and 2 cm. wide) with an obtusely bilobulate, rather than obliquely acute, apex. The flowers also are slightly smaller than those of the type, the segments being about 6 (instead of 7–8) mm. long. Although no pollinia were figured nor described in the type citation of this species, those seen in the Peruvian plant were four in number, of which the inner pair were larger. This relationship appears to be exactly reversed in the characterization of Orleanesia (B. Rodr. Gen. et Sp. Orch. Nov. 1 (1877) 63) where the two outer pollinia are indicated as larger.

Peru: Department of Loreto, vicinity of Iquitos, at 100 meters altitude, on a dead tree, in a clearing, flowers mignonette and dark violet, November to December, 1936, *G. Klug 10021*.

Polystachya cerea *Lindley* in Bot. Reg. 26 (1840) Misc. p. 86.

? *Polystachya caracasana* Reichenbach filius in Bonpl. 2 (1854) 15; in Walpers Ann. 6 (1863) 641.
Polystachya minor Fawcett & Rendle in Journ. Bot. 48 (1910) 106; Fl. Jam. 1 (1910) 49, t. 7, figs. 6, 7.
Polystachya guatemalensis Schlechter in Fedde Repert. 17 (1921) 141.
Polystachya ecuadorensis Schlechter in Fedde Repert. Beih. 8 (1921) 90; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 95, nr. 370.
Polystachya panamensis Schlechter in Fedde Repert. Beih. 17 (1922) 49.

There is no record at present of typical *Polystachya caracasana* in the Reichenbach Herbarium. Although this concept appears to be very close to *P. cerea*, of which we have seen a drawing of the type in the Lindley Herbarium, it seems to differ in having a subcordrate base to the lip and a long-petioled base to the leaves.

Polystachya minor, as described and figured by Fawcett & Rendle, differs from *P. cerea* only in being a much larger plant with a paniculate rather than a racemose inflorescence. However, the degree of vegetative size and the simple or compound character of the inflorescence is of no specific weight in Polystachya, for dwarf racemose plants appear in the same collection with large paniculate forms.

The concept, *Polystachya guatemalensis*, is represented in the Ames Herbarium by an analytical drawing made under the supervision of Dr. Schlechter. It is a large plant analagous to *P. minor*, but is described as having obtuse sepals, unlike those of *P. minor*. However, the drawing shows these organs as being acute. The only noteworthy difference between these species is that the mid-lobe of *P. guatemalensis* is described and shown as subcuneate-quadrate rather than ovate-subquadrate or elliptic-ovate as in *P. minor*. In view of the fact that the

mid-lobe is recurved in natural position, its exact shape is capable of various interpretations.

The plant named *Polystachya ecuadorensis* Schltr. is undoubtedly referable to *P. cerea*, having exactly the form and proportions of *P. minor*.

Polystachya panamensis, also represented in the Ames Herbarium by a drawing made under the supervision of Dr. Schlechter, appears to be inseparable from the *P. minor* form. The only differences are that its sepals and petals are described as obtuse and the basal callus on the lip as trilobulate.

This widespread and variable species extends from Mexico through Central America to Panama and the West Indies and to the northern portions of South America.

Polystachya nana (*Poepp. & Endl.*) *Reichenbach filius* in Walpers Ann. 6 (1863) 638.

Encyclia nana Poeppig & Endlicher Nov. Gen. ac Sp. Pl. 2 (1838) 10, t. 113 A.

Stelis foliosa Lindley in Ann. & Mag. Nat. Hist. 2 (1839) 330, t. 17.

Polystachya foliosa Reichenbach filius in Walpers Ann. 6 (1863) 640—Cogniaux in Martius Fl. Bras. 3, pt. 4 (1895) 316.

Dendrorchis nana O. Kuntze Rev. Gen. Pl. 2 (1891) 659.

The concept *Stelis foliosa* is described and figured as having the sepals equally large, whereas *Encyclia nana* has the dorsal sepal distinctly narrower than the lateral sepals. However, the dorsal sepal of *Polystachya foliosa* is described by Cogniaux and invariably appears, in all of the specimens which I have seen referred to that species from the West Indies and South America, as distinctly narrower than the lateral sepals.

In *S. foliosa* the mid-lobe of the lip is definitely the largest, while in *Encyclia nana* the lobes of the lip are described as equal. In the floral analysis of *E. nana*, however, the mid-lobe of the lip appears to be distinctly larger than the lateral lobes. In specimens of *Polystachya foliosa* in the Ames Herbarium the degree of excess in size of this lobe over the lateral lobes appears to vary considerably.

Whereas the flowers of *Stelis foliosa* were described as greenish, those of *Encyclia nana*, were cited as sulphur-colored. In a large series of specimens referable to *Polystachya nana* the color of the flowers (wherever noted) varies from yellow to orange.

In the types of both *Encyclia nana* and *Stelis foliosa* the inflorescence is described and shown as a simple raceme. In *Polystachya foliosa*, however, the inflorescence is described by Cogniaux as lightly branching and more rarely simple. This variation appears frequently in the specimens of *P. foliosa* examined, even in a single collection.

Considerable variability also appears in the proportions of the leaves of *P. foliosa*, the range being from elongate-linear with a width of 2 mm. to linear-elliptic with a width of over 9 mm. Also, the inflorescence varies from being much shorter than the leaves to distinctly exceeding them.

In *Stelis foliosa* almost the entire central longitudinal area of the lip was described and shown as densely and evenly glandular-downy or papillose. In *Encyclia nana* the farinaceous callus is basal. In all of the specimens which I have seen referred to *Polystachya foliosa* there is a prominent basal farinaceous callus, as in *Encyclia nana*.

It seems advisable, therefore, to consider these variable forms as conspecific.

It appears highly probable that the Brazilian *Poly-*

stachya stenophylla Schltr. may also be referable to the variable *P. nana*, but I have seen no authentic material of the former concept.

The range of *Polystachya nana* extends from the West Indies (Bahamas, Cuba, Jamaica, Hispaniola, Grenada, Trinidad) to British Guiana (type of *Stelis foliosa*), Surinam, northern Brazil and Peru (type of *Encyclia nana*).

Galeandra Baueri *Lindl.* var. **piloso-columna** *C. Schweinfurth var. nov.*

Herba carinis duabus brevibus plus minusve arcuatis atque columnae superficie anteriore plus minusve longe pilosa a specie differt.

Plant very similar to *Galeandra Baueri* but distinguished by having a pair of short more or less arcuate keels (instead of straight elongate keels) on the disc of the lip and especially by having a more or less prominently pilose anterior surface of the column.

This form is perhaps referable to *Galeandra dives* Reichb. f. (in Bonpl. 2 (1854) 98), in the description of which there is no reference to the column. I have seen no record of this concept. *G. dives* is treated as a synonym of *G. Baueri* Lindl. by Cogniaux in Mart. Fl. Bras. 3, pt. 4 (1895) 298.

Peru: Junin: Chanchamayo Valley, "1924–1927," *Carlos Schunke 534* (no leaves present) (type in Herb. Field Mus. No. 571592); same locality, at 1800 meters altitude, "Sept., 1924–1927," *Schunke s.n.*; La Merced, Hacienda Schunke, at about 1200 meters altitude, "Leafless epiphyte. Fls. yellowish-brown, the inner part light, the outer dark," August 27–September 1, 1923, *J. Francis Macbride 5599* (specimen consisting of a single flower preserved in alcohol).

Bletia catenulata *Ruiz & Pavon* Syst. Veg. (1798) 229—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1901) 350.

Bletia sanguinea Poeppig & Endlicher Nov. Gen. ac Sp. Pl. 1 (1835) 56, t. 95.

Bletia Sherrattiana Bateman in Bot. Mag. 93 (1867) t. 5646.
Regnellia purpurea Rodriguez Gen. & Sp. Orch. Nov. 1 (1877) 82, non Bletia purpurea DC.
Bletia Watsoni Hort. ex Orch. Rev. 2 (1894) 298.
Bletia Rodriguesii Cogniaux in Martius Fl. Bras. 3, pt. 5 (1901) 351, t. 74.
With the exception of *Regnellia purpurea* and *Bletia Rodriguesii*, all of the above names have previously been referred to the inadequately described *Bletia catenulata* Ruiz & Pav.

The concept *Regnellia purpurea*, being a true Bletia and widely different from *Bletia purpurea* DC., was given the name *Bletia Rodriguesii* by Cogniaux.

The plant which Reichenbach filius (in Bonplandia 4 (1856) 216) attributed to *B. catenulata*, was cited by Cogniaux as *Bletia Rodriguesii* (confined to Brasil). *B. Rodriguesii* is said to differ from *B. catenulata* in having narrower leaves, more obtuse petals, and more rounded lateral lobes of the lip which has three yellow lamellae instead of four white lamellae through the center. In the first place, the breadth of leaf, which is a variable character, is separated by only 5 mm. in the two contrasting species, according to the descriptions. Secondly, the petals of Peruvian specimens referable to *B. catenulata* are commonly broadly rounded at the apex (sometimes with a minute point at the tip). Again the lateral lobes of the lip are more or less broadly rounded at the apex, as in *B. Sherrattiana* from Colombia which was referred by Schlechter to *B. catenulata*. Finally, all of the Peruvian specimens of *B. catenulata* examined have from three to five low approximate thickened central nerves, which are called lamellae in the description. *B. catenulata* is described as having these keels whitish, whereas those of *B. Rodriguesii* are noted as yellow. In all of the Peru-

vian specimens referred to *B. catenulata* these keels, wherever a distinct color is noted, are described as yellow, as in *B. Sherrattiana.*

It appears to be the wise procedure, therefore, to recognize in this alliance only the single species *B. catenulata.*

Bulbophyllum Weberbauerianum *Kränzl.* var. **angustius** *C. Schweinfurth var. nov.*

Foliis angustioribus, floribus purpureis majoribus, petalis densissime fimbriatis, labello angustiore, columnae stelidiis brevioribus a specie differt.

Plant differing from the species in having narrower leaves (up to 4 cm. long and 7 mm. wide), larger purple flowers (dorsal sepal up to 1.85 cm. long, acute, with the lateral sepals only slightly larger than the dorsal sepal), densely fimbriate petals, longer narrower lip (up to 1.72 cm. long and 1 mm. wide above) and relatively short stelidia on the apex of the column.

Bolivia: Sailapata-Ayopaya, at 2000 meters altitude, on dry logs, flowers purple, November 1935, *M. Cardenas 3294* (Type in Herb. Ames No. 48462; dupl. type in Herb. Gray No. 7290).

Warrea tricolor *Lindley* in Bot. Reg. 29 (1843) Misc. p. 14—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1901) 376, t. 81.

Maxillaria Warreana Loddiges ex Lindley Gen. & Sp. Orch. Pl. (1832) 148—Loddiges Bot. Cab. (1833) t. 1884—Hooker in Bot. Mag. 72 (1846) t. 4235.

Warrea speciosa Schlechter in Fedde Repert. Beih. 9 (1921) 98; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 123, nr. 483.

The Peruvian *Warrea speciosa* differs from the Brazilian *Maxillaria Warreana*, the type of *W. tricolor*, in having distinctly larger floral segments. These are said

to be about 3.5 cm. long and 2.3–3.2 cm. wide, whereas those of *W. tricolor* are described as 2–2.5 cm. long and 1.2–2 cm. wide. The sepals and petals of *W. speciosa* are described as obtuse, but they are figured as more or less acute—as they are in *W. tricolor*. Moreover, the segments of *W. speciosa*, as depicted, appear to be almost an exact counterpart of those which Cogniaux attributes to *W. tricolor*. Finally, the anterior part of the lip of *W. tricolor* (as *Maxillaria Warreana*) is traversed by verrucose fleshy lines as attributed to *W. speciosa*.

Apparently there is no morphological difference between the two concepts, but only a discrepancy in size. Size appears to be less important as a differentiating character since the flowers of a Peruvian specimen (*Williams 7338*) which I have examined are intermediate between the two concepts.

Eriopsis biloba *Lindley* in Bot. Reg. 33 (1847) t. 18—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 586.

Pseuderiopsis Schomburgkii (as *Shomburgkii*) Reichenbach filius in Linnaea 22 (1849) 853.

Eriopsis Schomburgkii Reichenbach filius in Bonpl. 3 (1855) 67.

Eriopsis Wercklei Schlechter in Fedde Repert. 16 (1920) 447.

A careful examination of the Costa Rican *Eriopsis Wercklei*, as represented by an analytical drawing of the type made under the supervision of Dr. Schlechter, as well as by authentic material in the Ames Herbarium, show that this concept is referable to *E. biloba*, which is well illustrated and described. Apparently the only discrepancy between these concepts is that *E. Wercklei* is said to have longer leaves than *E. biloba*. Sometimes, also, the sepals and petals of *E. Wercklei* are slightly larger than those attributed to *E. biloba*.

A recent Peruvian collection (*Klug 3678*) referable to *E. biloba* differs from typical material in having a relatively elongate pseudobulb (up to 16 cm. tall) bearing three leaves (instead of two) near the summit. The leaves vary greatly, the two lower blades being elliptic-oblong and up to 44 cm. long and 7 cm. wide, whereas the upper leaf is narrow and about 30 cm. long and 3.4 cm. wide. The scape is also short, about 35 cm. tall.

Peru: San Martín: Zepelacio, near Moyobamba, at about 1100 meters altitude, epiphyte in mountain forest, flowers brown, yellow, green and white, June, 1934, *G. Klug 3678*.

Eriopsis sceptrum *Reichenbach filius & Warscewicz* in Bonpl. 2 (1854) 98—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 588.

Eriopsis Helenae Kränzlin in Gard. Chron. ser. 3, 22 (1897) 98—Rolfe in Bot. Mag. 138 (1912) t. 8462.

The concept *Eriopsis Helenae* appears to differ from *E. sceptrum* only in the larger size of its flowers. In these the sepals are described as about 2 cm. long, whereas those of *E. sceptrum* seem to be 1.6 cm. or less long in the drawing of its flowers from the original sketches in the Reichenbach Herbarium. In these drawings, the sinus between the lobes appears to vary from being acute-angled (as described) to being rounded (as in *E. Helenae*). Although no mention of the vegetative parts of *E. sceptrum* appears in the description, the records of that species from the Reichenbach Herbarium show a cluster of roughly sketched elongate pseudobulbs similar to those of *E. Helenae* and they bear at the summit a pair of leaves which appear to be much shorter than those of *E. Helenae*.

A recent Peruvian collection (*Klug 1351*) has flowers of apparently the same size as those of *E. sceptrum* with a rounded sinus between the lobes (as in *E. Helenae*) and

a mid-lobe which varies from broadly truncate-obtuse to lightly retuse as specified in *E. sceptrum*. In these plants the pseudobulb is entirely enveloped by distichous sheaths (like the immature stems of *E. Helenae*): the leaves are oblong to elliptic-oblong, and shining in the dried specimen, and they attain a length of almost 50 cm. and a width of nearly 6 cm. The scape is about 60 cm. or less tall, as in *E. Helenae*, whereas that of *E. sceptrum* is noted as about 90 cm. tall. The pair of basal lamellae on the lip appear to be sometimes more or less recurved, as in *E. sceptrum*.

It appears reasonable, therefore, to consider *Eriopsis sceptrum* as including the larger-flowered *E. Helenae*.

Peru: Loreto, Mishuyacu, near Iquitos, at 100 meters altitude, in forest, flowers brown-yellow, May–June, 1930, *G. Klug 1351*.

Polycycnis muscifera (*Lindl. & Paxt.*) *Reichenbach filius* in Bonpl. 3 (1855) 218; in Walpers Ann. 6 (1863) 618 *ampl. C. Schweinfurth*.

Cycnoches muscifera (as *musciferum*) Lindley & Paxton in Paxton's Flow. Gard. 3 (1852–53) 28, fig. 248.

Since the original description of *Cycnoches muscifera* lacks vegetative characters and is largely restricted to brief floral details, supplemented by a telling figure, it seems worthwhile to append a complete description of this concept based on several recent Peruvian collections.

Plant rather large. Roots fibrous, glabrous, rather slender. Pseudobulb pyriform-cylindric, unifoliate at the apex, clothed with evanescent sheaths, densely rugose when dry, 5 to over 6 cm. long. Leaf distinctly petioled; lamina elliptic, acute, cuneate below, up to 37 cm. long and 12 cm. wide, plicate; petiole 8–11.5 cm. long, slender, channelled. Scape lateral, basal, suberect to arcuate, sublaxly to densely racemose above; pedumele provided with several remote close short sheaths, densely dark-

pubescent, up to 28.2 cm. long; raceme many-flowered, straight or more commonly arcuate or flexuous, the rachis being 34 cm. or less long. Flowers rather small for the genus, with spreading or reflexed segments, "pale bistre plentifully bestrewed with minute brown specks and freckles." Sepals membranaceous, dark-pubescent without. Dorsal sepal refracted, deeply cucullate, oblong-lanceolate, acute, up to 2 cm. long and 5 mm. wide when expanded. Lateral sepals broadly oblong-lanceolate, oblique, complicate-acute, up to 1.8 cm. long and 6 mm. wide. Petals oblanceolate-linear, slightly sigmoid, acute, up to 2.1 cm. long and 2.5 mm. wide. Lip up to 1.7 cm. long, deeply 3-lobed, sharply divided into a hypochile and epichile; hypochile at base with a pair of linear-falcate erect-spreading horns, above rather abruptly dilated into a pair of erect obliquely lanceolate or lanceolate-triangular acuminate lateral lobes, pubescent through the middle where dilated above into a relatively high fleshy pubescent semielliptic keel; epichile relatively large, hastate-ovate or triangular-ovate, simple or subtrilobed with more or less conspicuous rounded subbasal angles, acuminate to a complicate-acute apex, densely bearded except near the apex. Column very slender, arcuate, abruptly bialate at the apex, about 2 cm. long.

PERU: Junín, Chanchamayo Valley, at 1200–1500 meters altitude, *Carlos Schunke 1120, 1290, s.n.;* Schunke Hacienda, above San Ramón, at 1300–1700 meters altitude, in dense forest, *Schunke 469.*

Gongora maculata *Lindley* var. **bufonia** (*Lindl.*) *C. Schweinfurth comb. nov.*

Gongora bufonia Lindley in Bot. Reg. 27 (1841) t. 2—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 542. *Gongora bufonia* Lindl. var. *leucochila* Lindley in Bot. Reg. 33 (1847) t. 17.

An intensive study has convinced me that the concept

G. bufonia is a variety of the widespread and variable *G. maculata*. It is distinguished from the latter species by the total or partial absence of horns near the base of the hypochile. In some of its forms there does not appear to be a vestige of the horns which are so prominent in *G. maculata;* in the illustration of the type of *G. bufonia* (l. c.) the horns are reduced to conical swellings, while some examples referable to this variety have rather well-developed conical protuberances. The variety *bufonia* appears to have often slightly larger flowers than *G. maculata*. Frequently, too, the hypochile is much lower at the base than at the apex.

Whereas *Gongora bufonia* was formerly credited only to Brazil, I have recently examined numerous collections of this concept from the Peruvian departments of Loreto and San Martín.

Xylobium foveatum (*Lindl.*) *Nicholson* Dict. Gard. 4 (1887) 225—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 469.

Maxillaria foveata Lindley in Bot. Reg. 25 (1839) Misc. p. 2—Lindley & Paxton in Paxt. Flow. Gard. 3 (1852–53) 70, sub no. 536.

Maxillaria concava Lindley in Bot. Reg. 30 (1844) Misc. p. 4.

Maxillaria stachyobiorum Reichenbach filius in Bot. Zeit. 10 (1852) 735.

Xylobium concavum Hemsley in Godman & Salvin Biol. Centr.-Am. 3 (1883) 252.

Xylobium stachyobiorum Hemsley in Godman & Salvin Biol. Centr.-Am. 3 (1883) 252.

Xylobium Filomenoi Schlechter in Fedde Repert. Beih. 9 (1921) 100; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 124, nr. 487.

Judging from a photograph of the type of *Maxillaria*

concava from the Lindley Herbarium at Kew, this concept does not appear to be specifically distinct from the earlier *M. foveata* similarly represented in the Ames Herbarium. In the two records the scapes with their flowers seem to be nearly identical. The lateral sepals of *Maxillaria concava* are described as dorsally carinate near the apex, and no mention is made of such a character in *M. foveata;* but the photograph of the latter plant, when examined closely, indicates the presence of such an apical keel on the lateral sepals. Another apparent discrepancy between these concepts lies in the callus on the lip which consists of five raised lines in the drawing of the lip on the sheet of *M. foveata*, whereas an apically tridentate callus is depicted on the sheet of *M. concava.* This apparent difference is non-existent, however, for the lip of *M. foveata* is described as three or five times sulcate. Finally, the leaf of *M. concava* appears to be about twice as broad as that of *M. foveata*, but the proportions of the leaf in one collection of Xylobium often show similar discrepancies.

It has already been clearly shown that *Maxillaria stachyobiorum* is referable to the above species.

The concept *Xylobium Filomenoi*, described only from several inflorescences accompanied by a colored sketch, differs from *Maxillaria foveata* in having somewhat smaller flowers. In spite of minute disparities from *Xylobium foveatum* in the structure of the lip, it is apparent that this concept is synonymous with *X. foveatum.*

In the original description of *Maxillaria foveata* there was no mention of the pseudobulb, which apparently was lacking in the Lindley specimen. However, in the descriptions of *Maxillaria concava* and *M. stachyobiorum*, as well as in the numerous collections of this species from Central America (especially from Costa Rica and Panama) and from Peru, there is present an ovoid or oblong-

ovoid bifoliate or trifoliate pseudobulb which varies from 3 to 9 cm. in length.

This species appears to be very variable and widespread, being recorded from Mexico and Guatemala (type of *Maxillaria concava*) through Central America to Panama (type of *M. stachyobiorum*); from Jamaica; from the South American countries of British Guiana (type of *M. foveata*), Venezuela, Colombia and Peru (type of *Xylobium Filomenoi*).

Xylobium pallidiflorum (*Hook.*) *Nicholson* Dict. Gard. 4 (1887) 225—Cogniaux in Urban Symb. Antill. 6 (1910) 588.

Maxillaria pallidiflora Hooker in Bot. Mag. 55 (1828) t. 2806.

Maxillaria stenobulbon Klotzsch in Ind. Sem. Hort. Berol. Append. Spec. Nov. (1853) 1.

Xylobium latifolium Schlechter in Fedde Repert. 27 (1929) 66.

The concept, *Maxillaria stenobulbon*, has already been reduced to the synonymy of this species.

A comparison between the typical West Indian *Maxillaria pallidiflora* (as exemplified by the plate) and the Bolivian *Xylobium latifolium* (as elucidated by the description) shows that the latter concept apparently differs only in having slightly smaller flowers.

Furthermore, a collection (*Hodge 297.3*) from Dominica near St. Vincent, which is the type locality of *Maxillaria pallidiflora*, differs from *X. latifolium* only in having slightly longer scapes with white instead of yellow flowers which are somewhat larger than those of *X. latifolium*.

A Peruvian collection (*Klug 3619*) referable to *X. pallidiflorum* has variable vegetative proportions with leaf-blades ranging from elliptic (as in *X. latifolium*) to

oblanceolate, often much larger than those of *X. pallidiflorum*, and with sometimes very elongate petioles. The flowers, however, are said to be light green and orange, similar to those of *Maxillaria pallidiflora* and are but slightly larger in size.

It seems reasonable to conclude, therefore, that all of these collections, including some recorded from Venezuela and Ecuador, belong to a single variable concept.

Xylobium squalens (*Lindl.*) *Lindley* in Bot. Reg. 11 (1825) sub t. 897—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 468.

Dendrobium squalens Lindley in Bot. Reg. 9 (1823) t. 732.

Maxillaria squalens Hooker in Bot. Mag. 56 (1829) t. 2955.

Dendrobium carnosum Presl Symb. Bot. (1832) 35, t. 24.

Cyrtopera scabrilinguis Lindley Gen. & Sp. Orch. Pl. (1833) 189.

Maxillaria supina Poeppig & Endlicher Nov. Gen. ac Sp. 1 (1836) 39, t. 67.

Xylobium Houttei Makoy ex Mutel Mém. sur plus. Orch. 1 (1840) 16.

Maxillaria scabrilinguis Lindley in Bot. Reg. 30 (1844) Misc. p. 71.

Xylobium scabrilingue Schlechter in Orchis 7 (1913) 23.

Xylobium supinum Schlechter in Orchis 7 (1913) 24.

Xylobium carnosum Schlechter in Fedde Repert. Beih. 9 (1921) 160.

Except for *Xylobium carnosum* (based on *Dendrobium carnosum*) and *X. scabrilingue* (based on *Cyrtopera scabrilinguis*), all of the above concepts have previously been reduced to the synonymy of *X. squalens*.

The concept *Dendrobium carnosum*, which was described from material lacking a pseudobulb, appears to differ from *Xylobium squalens* only in having a longer

inflorescence, in the slightly shorter floral bracts and in the somewhat narrower dorsal sepal and petals. Therefore, it seems reasonable to consider this form as reducible to *X. squalens.*

Cyrtopera scabrilinguis, exemplified by a photograph of the type from the Lindley Herbarium at Kew, is a plant with a rather loose raceme, having flowers of apparently the same size and shape as those of *X. squalens.* Moreover, this record bears two drawings of the lip which appear nearly identical with the lip of *X. squalens*, a species which has a more or less compact raceme. In the photograph the floral bracts are indistinct, but under *Maxillaria scabrilinguis* they are described as shorter than the [pedicellate] ovary, unlike those of *X. squalens*, in which the floral bracts commonly more or less exceed the ovary. Several specimens determined as *X. scabrilingue* have a lip with the mid-lobe rather more ovate than obovate or oval as in *X. squalens*, but that portion when expanded approximates the mid-lobe of the latter species. Finally, the color of the flowers in both concepts, while apparently variable, is often closely similar.

It seems to be entirely logical, therefore, to regard *Xylobium scabrilingue* as conspecific with *X. squalens.*

This concept, like most widespread species, is very variable, both in vegetative and floral size. One Peruvian collection (*Klug 10123*) even has a pseudobulb bearing three leaves, instead of the usual two leaves. The color of the flowers varies from white to yellowish or pinkish, streaked with violet, the lip being much darker violet.

Xylobium squalens is recorded chiefly from South America (Brazil, Venezuela, Ecuador, Peru and Bolivia), with one record from Costa Rica in Central America.

Xylobium squalens (*Lindl.*) *Lindl.* var. **gracile** (*Schltr.*) *C. Schweinfurth comb. nov.*

Xylobium gracile Schlechter in Fedde Repert. Beih. 8 (1921) 92; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 95, nr. 372.

This concept differs from the variable *X. squalens* in two particulars. First, it has unifoliate pseudobulbs, whereas *X. squalens* commonly has bifoliate (or very rarely trifoliate) pseudobulbs. Secondly, it has floral bracts three or four times shorter than the pedicellate ovary, whereas *X. squalens* has floral bracts that vary from little shorter than the pedicellate ovary (in the *X. scabrilingue* form) to longer than the flower. Judging from the floral analysis, the flower appears to be identical with a small form of *X. squalens*, except that the mid-lobe of the lip appears to be relatively slightly larger in proportion to the entire lamina.

Lycaste fimbriata (*Poepp. & Endl.*) *Cogn.* var. **peruviana** (*Rolfe*) *C. Schweinfurth comb. nov.*

Lycaste peruviana Rolfe in Kew Bull. (1910) 160.

Judging by the description, supplemented by several flowering scapes of *L. peruviana* (from the Kew Herbarium) which may be regarded as typical, it seems reasonable to consider this concept as a variant of *L. fimbriata*. The latter species appears to be very variable, both in vegetative and floral proportions, in the degree of toothing of the mid-lobe of the lip and, to a lesser extent, in the color of the flowers.

There do not appear to be any morphological differences between the concepts, however, and the only disparities seem to be the strikingly smaller size of the leaves and floral segments of *L. peruviana*, whose sepals and petals are described as light tawny-brown, as contrasted with greenish, white or cream-color in *L. fimbriata*.

The exact source of *L. peruviana* is not recorded, the plant having been collected in Peru by Forget and introduced by Messrs. Sander & Sons of St. Albans, England.

Pityphyllum laricinum (*Kränzl.*) *Schlechter* in Fedde Repert. Beih. 7 (1920) 163.

Maxillaria laricina Kränzlin in Engler Bot. Jahrb. 54 (1916) Beibl. 117, p. 29.

An examination of isotype material of *Maxillaria laricina* Kränzl. shows that there are several misconceptions and inaccuracies in the type description (l.c.), and therefore it seems advisable to correct these misstatements.

Of first importance is the fact that the so-called abbreviated leafy branches, or "ramuli foliati abbreviati, folia . . . fasciculum foliorum *Laricis* cujusdam aemulantia," actually represent small plants of a Bromeliad. The suspected identity of this epiphyte on an epiphyte was corroborated by Dr. Lyman B. Smith of the Gray Herbarium who tells me that in all probability the visitor is a species of Tillandsia.

Careful investigation also shows that the pseudobulbs are commonly bifoliate (not trifoliate) and mostly about 10 mm. (not 7 mm. or less) long. The leaves, which also appear on some of the cauline sheaths as well as on the pseudobulbs, are up to 1.5 cm. (rather than 1.2 cm.) long. The sepals are lanceolate and about 3.7 mm. (rather than 3 mm.) long. The petals, which are thinner in texture than the sepals, are linear and about 3 mm. (rather than 2.5 mm.) long. The lip, which is described as simple and oblong, is in reality constricted (and thus trilobulate) above the middle and ovate-elliptic in outline when flattened. It lacks a definite basal callus (as described), but has instead a pair of short arcuate folds near the constriction.

This little plant was transferred by Schlechter to the genus Pityphyllum, a segregate from Maxillaria on the basis of the minute flowers and footless column.

The species occurs in the Peruvian departments of Cajamarca (type of *Maxillaria laricina*) and Junín, fide Schlechter (in Fedde Repert. Beih. 9 (1921) 161.

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AFRICAN ORCHIDS. XIV

BY

V. S. SUMMERHAYES

(*Royal Botanic Gardens, Kew*)

ANCISTRORHYNCHUS *Finet*

IN 1837 Lindley described *Angraecum clandestinum* from a plant cultivated in Messrs. Loddiges' nursery at Hackney, while in 1862 in his classical paper on West African orchids, he described *A. capitatum*, which was collected by Barter near the Brass River in Southern Nigeria. Ten years later the younger Reichenbach published a description of a species from the famous living collection of W. W. Saunders under the name of *Listrostachys cephalotes*. He pointed out its affinity with *Angraecum capitatum* Lindl. and for the first time clearly described the remarkable folded rostellum, which is actually common to all three species mentioned. Rolfe seems to have missed the significance of this feature, for in the Flora of Tropical Africa, although he places the above species, and also two additional ones of the same affinity, in the genus *Listrostachys*, he separates *L. clandestina* from the others and only refers vaguely to the rostellum in the specific descriptions. Instead he places greater emphasis on the occurrence of the flowers in short dense heads.

It was not until 1908 that Finet created the genus *Ancistrorhynchus*, containing two properly described and one imperfect species, the genus being especially charac-

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terised by the striking rostellum structure. This organ projects downwards almost parallel with, or slightly diverging from, the front of the column and is then folded on itself to form an upwardly directed portion of sometimes equal length ending in an acute apex. On removal of the long and narrow viscidium, which is also folded in a similar manner, the two lateral lobes may be easily separated and then appear as shown in Finet's illustrations. Owing to the incomplete description of *Angraecum clandestinum* by both Lindley and Rolfe, Finet failed to realise that it also fell into his new genus, nor does he refer to any of the other species with similar rostellum included in the Flora of Tropical Africa.

It was Schlechter, in his account of the Angraecoid orchids in 1918, who first brought together all the species with the above rostellum. He divided them into two genera, *Aneistrorhynchus* Finet with a distinctly trilobed lip and a single pollinarium stipes entire or divided only at the apex, and secondly a new genus *Cephalangraecum*, characterised by an entire lip and the presence of two separate stipites to the pollinia. Incidentally in his comments on the latter genus he states that the stipe may sometimes be common (gemeinsam) but I cannot find on what authority this statement rests. It is certainly not true of any of the species included by him.

When I dealt with the two genera in the Flora of West Tropical Africa I separated them on account of the difference in the stipes and also the very different appearance of the leaves. In *Cephalangraecum* the leaves are only slightly unequally bilobed at the apex with more or less rounded lobes whereas in the species of *Aneistrorhynchus* which I had seen the leaves are much more unequally bilobed with acute lobes. The inflorescences also are distinctly less dense in *Aneistrorhynchus* than in the other genus.

Recently, however, my attention has been drawn to two East African species, namely *Ancistrorhynchus laxiflorus* Mansf., from the Uluguru Mountains in Central Tanganyika and *Listrostachys refracta* Kraenzl., from Usambara in the north of the same territory. This latter species was erroneously referred to *Cyrtorchis* by Schlechter although Kraenzlin's description clearly portrays the characteristic rostellum of the two genera referred to above. The interesting feature of these two species, which are evidently very closely allied, if not conspecific, is that they combine the supposed distinguishing features of *Ancistrorhynchus* and *Cephalangraecum*. The inflorescences are relatively lax and elongated as in the former genus, whereas the leaves are similar to those in many species of the latter. The pollinarium is intermediate, the stipes being divided to the middle in *L. refracta* and nearly as far in *A. laxiflorus*.

It is evident, therefore, that the two genera cannot be maintained as distinct since all the supposed differential characters break down, while at the same time the extremely striking rostellum remains almost constant throughout. It should be noted that in many of the species the lip is widened at the base forming large rounded but rather indistinct lobes, and indeed in few of the species is the lip clearly quite entire. An emended description is provided herewith.

Ancistrorhynchus *Finet* in Mém. Soc. Bot. France 9 (1907) 44–47—Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 137–139—Summerhayes in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 462.

Cephalangraecum Schlechter l.c. 135–137—Summerhayes l.c. 461–462.

Epiphytic herbs; stems short and thick; leaves imbricate, suberect, spreading or recurved, parallel-sided

or tapering upwards, more or less unequally bilobed at the apex, lobes sometimes toothed or slightly lobulate, often fleshy and sometimes V-shaped with a keel: inflorescences arising from the axils of the lower leaves, almost sessile, usually forming globular or ellipsoid densely-flowered heads but sometimes laxer and few-flowered; rhachis short, usually thick; bracts small or more frequently large, membranous or chartaceous and equalling the flowers; flowers mostly white, sometimes with green markings; sepals oblong, elliptical or lanceolate, obtuse, laterals oblique; petals similar but usually narrowed in the lower part; lip oblong, ovate or almost orbicular in general outline with rounded apex and often widened at the base to form rounded rather indistinct lateral lobes, sometimes distinctly 3-lobed, front lobe usually undulate; spur straight or somewhat S-shaped, wide at the base, constricted in the middle and dilated at the apex, shorter than the ovary; column short or of medium length, semiterete; anther hemispherical, produced in front into a short truncate appendage only partially covering the rostellum; pollinia 2, globose or pyriform, stipes either 2 distinct to the base or a single one more or less bilobed in the upper half, apex in either case broad and flattened, viscidium long and narrow, attached to almost the entire length of the rostellum; rostellum projecting downwards in the basal half and parallel with or slightly divergent from the column, then sharply curved upwards terminating in an acute apex, on removal of the pollinia cleft to the base into two sickle-shaped lobes; stigmatic cavity below the rostellum and almost covered by it.

Type Species:—*A. recurvus* Finet.

The following is an enumeration of the species of *Anistrorhynchus* accepted here, with such synonymy as can

be ascertained with reasonable certainty. I have not seen a few of the species and for the moment the position of these must remain doubtful. Some name changes may be necessary when they have been investigated properly. The type specimens of the two new species are in the Kew Herbarium.

1. **Ancistrorhynchus brevifolius** *Finet* in Mém. Soc. Bot. France 9 (1907) 45, t. IX, figs. 1–14—Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 138.

From the description and illustration this species possesses the pollinarium of *A. recurvus* and leaves similar to those of many *Cephalangraecums*, that is, V-shaped in section with rounded apical lobes. The very broad trilobed lip and divergent spur are also characteristic.

French Congo: Bangui, *Dybowski 567* (not seen).

2. **Ancistrorhynchus capitatus** (*Lindley*) *Summerhayes comb. nov.*

Angraecum capitatum Lindley in Journ. Linn. Soc. Lond. Bot. 6 (1862) 137.
Listrostachys capitata Reichenbach filius in Flora 48 (1865) 190—Durand & Schinz Consp. Fl. Afr. 5 (1895) 48—Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 166.
Angorchis capitata O. Kuntze Rev. Gen. Pl. (1891) 651.
Listrostachys Gentilii De Wildeman Not. Pl. Utiles Congo (1903) 147; in Ann. Mus. Congo, Bot. sér. V. 1 (1904) 117, 2 (1907) 28; Mission É. Laurent (1906) 227, figs. 29, 30—Th. & H. Durand Syll. Fl. Congol. (1909) 530.
Cephalangraecum capitatum Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 136—Summerhayes in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 461.

Cephalangraecum Gentilii Schlechter l.c.

The denticulate apical lobes of the leaves distinguish this species from all the other described ones. These teeth vary considerably in size and number even on the same plant. The spur is also exceptionally long while the lip is more or less ovate and the basal lateral lobes very poorly developed.

Sierra Leone: Koyeima, *Deighton 3360.*

Liberia: Firestone Plantation No. 3, *Linder 64.*

Nigeria: Brass River, *Barter 1857* (Type).

Belgian Congo: Bombe, Momboyo River, *Gentil* (not seen); Stanleyville, *Pynaert 115;* Eala, *Laurent 752* (not seen).

Many more gatherings have been recorded from the Belgian Congo under the name of *Listrostachys capitata* but I have not seen any of them.

3. **Ancistrorhynchus cephalotes** (*Reichenbach filius*) *Summerhayes comb. nov.*

Listrostachys cephalotes Reichenbach filius in Gard. Chron. (1872) 1687—Durand & Schinz Consp. Fl. Afr. 5 (1895) 48—Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 166.

Cephalangraecum cephalotes Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 136.

From the rather incomplete description of this species I suspect it to be the same as *A. glomeratus* (Ridley) Summerhayes but as I have not seen the type specimen of *A. cephalotes* I hesitate to put the two together.

West Africa: No exact locality; cult. *W. W. Saunders*, Reigate, Surrey, in 1872 (not seen).

4. **Ancistrorhynchus clandestinus** (*Lindley*) *Schlechter* in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 138—Summerhayes in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 462, *pro maxima parte.*

Angraecum clandestinum Lindley in Hooker Comp. Bot. Mag. 2 (1837) 206—Reichenbach filius in Walp. Ann. 6 (1864) 906—Durand & Schinz Consp. Fl. Afr. 5 (1895) 41.
Angorchis clandestina O. Kuntze Rev. Gen. Pl. (1891) 651.
Listrostachys clandestina Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 161.
Angraecum clandestinum var. *stenophyllum* Schlechter Westafr. Kautsch. Exped. (1900) 283.
Listrostachys Durandiana Kraenzlin apud Durand & De Wildeman in Compt. Rend. Soc. Bot. Belg. 38 (1899) 65 (Mater. Fl. Congo 3 (1889) 57)—De Wildeman in Ann. Mus. Congo, Bot. sér. V., 1 (1903) 25.
Angraecum brunneo-maculatum Rendle Cat. Talb. Nig. Pl. (1913) 105, 146, t. 14, figs. 6–9.
Ancistrorhynchus brunneo-maculatus Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 138.
Ancistrorhynchus Durandianus Schlechter l.c.
Ancistrorhynchus stenophyllus Schlechter l.c. 139.

A. clandestinus may be distinguished by the long narrow leaves which taper in the upper portion, terminating in a relatively sharp point formed by the longer apical lobe; the shorter lobe may be present as a small tooth as much as 5 cm. below the extreme apex or may be entirely absent, both types of leaf sometimes occurring on the same plant. In the type plant, a cultivated one, the leaves are only about 15 cm. long, but in other specimens, for example from the Belgian Congo and the Gabon, they may exceed a meter in length, and all intermediates have been noted. There may also be great variation in the fleshiness of the leaves but I have not been able to correlate this with other characters.

The inflorescences in *A. clandestinus* are longer and looser than in the species formerly included in *Cephalan-*

graecum while the bracts are triangular-ovate and comparatively short. The lip is distinctly trilobed, the middle lobe being more or less concave with an undulate somewhat infolded margin. The S-shaped spur separates the species from the *Cephalangraecum* species, but is also found in *A. recurvus* Finet and two Tanganyika species.

Sierra Leone: cult. *Loddiges 1834* (Type); Kuntaia, *Thomas 430;* Kamalu, *Thomas 491.*
Nigeria: Onitsha, *Barter 444;* Eket, *Talbot 3744;* Degema, *Talbot;* Oban, Ekong-Ndingane road, *Talbot 943;* Cameroons Mt., Buea, *Schlechter 12843.*
Gabon: Upper Ngounyé River, Lake Bandoungou, *Le Testu 5159.*
Belgian Congo: Pioka, *Laurent* (not seen).

5. **Ancistrorhynchus glomeratus** (*Ridley*) *Summerhayes comb. nov.*

Angraecum glomeratum Ridley in Gard. Chron. new ser. 24 (1885) 678—Durand & Schinz Consp. Fl. Afr. 5 (1895) 43.
Listrostachys glomerata Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 166.
Cephalangraecum glomeratum Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 136—Summerhayes in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 461.

Distinguished by the slightly unequal apical lobes of the leaves which are rounded or slightly retuse or bilobulate but not denticulate, the very broad lip with the rounded almost hastate base enveloping the column and the relatively long spur. It may be necessary to reduce this species to *A. cephalotes* (Rchb.f.) Summerh. when the type specimen of the latter has been examined.

French Guinea: Faranah, near R. Niger, *Chevalier 20469.*
Sierra Leone: no locality, cult. *Lendy* (Type); cult. Hort. Kew.
Liberia: M. Barclay, *Bunting 7;* no locality, cult. Hort. Kew, 1865.
Nigeria: Nun River, *Barter 20106.*

6. **Ancistrorhynchus laxiflorus** *Mansfeld* in Notizbl. Bot. Gart. Berl. 12 (1935) 705.

This species may be recognised from all other species except *A. refractus* (Kraenzl.) Summerh. by the lax few-flowered but short inflorescences, the entire ovate lip and long slender column. The leaves are similar to those in *A. glomeratus* (Ridl.) Summerh. or *A. ovatus* Summerh. The pollinarium stipes is divided in the upper part while the viscidium is lanceolate and exceptionally large (over 8 mm. long altogether).

TANGANYIKA TERRITORY: Uluguru Mts., Mt. Mindu, *Schlieben 3731.*

7. **Ancistrorhynchus Metteniae** (*Kraenzlin*) *Summerhayes comb. nov.*

Angraecum cephalotes Kraenzlin in Mitteil. Deutsch. Schutzgeb. 2 (1889) 156, non *Listrostachys cephalotes* Reichenbach filius.

Listrostachys Metteniae Kraenzlin Xen. Orch. 3 (1893) 122, t. 270.

Listrostachys Braunii Durand & Schinz Consp. Fl. Afr. 5 (1895) 48—Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 166.

Cephalangraecum Metteniae Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 137.

Cephalangraecum Braunii Summerhayes in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 462.

Easily recognised by the very short spur (2–3 mm. long) and broad almost orbicular lip with indistinct side lobes more or less enclosing the column. The leaves vary considerably in width and in the inequality of the apical lobing, but are usually rather narrow. A specimen from Mt. Mlinga, East Usambaras, Tanganyika Territory, collected by W. M. Moreau (No. 371) seems to be nearest this species but is more robust with broad leaves, slightly larger flowers and a spur nearly 4.5 mm. long.

It may eventually prove to be a distinct but closely allied species.

In the Flora of West Tropical Africa I used the epithet *Braunii* for this species under the mistaken impression that the portion of Volume 5 of Durand and Schinz's Conspectus in which it was first published appeared in 1892, a year before Kraenzlin's publication of the epithet *Metteniae*, both being based on the same type. On further examination of the evidence I am led to the view that the whole of the volume in question was not published until 1895 thus giving Kraenzlin's epithet two year's priority.

NIGERIA: Lagos, *Moloney*.

CAMEROONS: no locality, *Braun 19* (TYPE).

ST. THOMAS: Angolares, Lagoa Angra de S. Joao, *Quintas 12* (fruit only).

UGANDA: Entebbe, *Fyffe 70;* near Bajo, *Dümmer 2825*.

8. **Ancistrorhynchus ovatus** *Summerhayes sp. nov.* affinis *A. glomerato* (Ridl.) Summerh. et *A. Metteniae* (Kraenzl.) Summerh., ab hoc calcari quam labello fere duplo longiore, ab utroque labello ovato integro basi columnam haud involvente distinguitur.

Herba epiphytica; caulis usque ad 20 cm. longus, fere 5 mm. diametro, superne foliatus, inferne vaginis foliorum delapsorum ± obtectus, radices ramosas flexuosas squamuloso-rugulosas 1–2 mm. diametro emittens. *Folia* basi imbricata, suberecta, patentia vel rarius recurvata, lineari-ligulata, supra articulum 7–19 cm. longa, 5–14 mm. lata, basi vix angustata, apice inaequaliter bilobata, lobis rotundatis vel rotundato-acutis interdum brevissime bilobulatis vel retusis lobo longiore usque ad 1 cm. longo, superne plana, basi ± conduplicata, costa supra impressa subtus leviter carinata. *Inflorescentiae* ex axillis foliorum inferiorum exortae, sessiles, globoso-vel ovoideo-capita-

tae, 1–2 cm. longae et diametro, multiflorae; bracteae flores aequantes, ligulatae, oblanceolatae vel ovato-lanceolatae, acutae, 6–12 mm. longae, usque ad 5 mm. latae, scariosae. *Flores* albi; pedicellus cum ovario 6–8 mm. longus. *Sepalum* intermedium oblongo-ellipticum, apice rotundatum, 3.3–4.4 mm. longum, 1.3–2 mm. latum; sepala lateralia elliptico-oblonga, leviter obliqua, apice rotundata, 3.5–4.6 mm. longa, 1.3–2 mm. lata; omnia sepala trinervia. *Petala* late elliptico-oblanceolata, apice rotundata, 3.25–4.5 mm. longa, 1.3–2.1 mm. lata, trinervia, nervis lateralibus breviter ramosis. *Labellum* ± concavum, late ovatum, apice rotundatum, 3–4.25 mm. longum, 2.4–3.5 mm. latum, marginibus leviter flexuosis et undulatis; calcar ex ore lato sensim angustatum, triente apicali inflatum, apice ipso rotundatum, totum 4.6–5.8 mm. longum. *Columna* crassa, semiteres, 0.8–1.4 mm. alta, truncata, androclinio leviter excavato; anthera subhemisphaerica, antice breviter producta, truncata; pollinia fere globosa, stipitibus 2 apice recurvatis spathulato-dilatatis, 0.5–0.7 mm. longis, viscidio medio implicato elliptico-ligulato, 0.8–1.2 mm. longo; rostellum inferne descendens, deinde hamato-implicatum, apice acutum, in toto circiter 1 mm. longum, viscidio amoto fere ad basin bipartitum; fovea stigmatica quadrato-elliptica.

Evidently closely allied to *A. glomeratus* (Ridl.) Summerh. and *A. Metteniae* (Kraenzl.) Summerh. with which it agrees closely in habit and leaf characters. The combination of ovate lip without the least sign of the rounded side lobes so characteristic of the other two species and moderately long slender spur distinguishes it from both of them.

Belgian Congo: Prov. of Uele, R. Wamba, 1911, *Claessens 1047*.
Uganda: Budongo Forest, *Eggeling 3053;* Budongo, June 1937, *Eggeling 3360;* Budongo, Bunyoro, June 1935, *Eggeling 2048* (Type).

9. **Ancistrorhynchus parviflorus** *Summerhayes sp. nov.* ab *A. Straussii* (Schltr.) Schltr. foliis brevioribus minus bilobatis, labello latiore quam longo, calcari fere globoso quam labello breviore, columma crassiore et breviore, polliniis pro rata majoribus distinguendus.

Herba epiphytica; caulis circiter 5 cm. longus et 3 mm. diametro, superne dense foliatus, inferne radices flexuosas 1–1.5 mm. diametro emittens. *Folia* basi imbricata, patentia, rigida, linearia-oblonga vel ligulata, supra articulum 3–4 cm. longa, 6–8 mm. lata, basi leviter angustata, apice leviter inaequaliter bilobata, lobis obtusis vel rotundatis leviter incurvatis, costa subtus prominenti, nitida, viridissima. *Inflorescentiae* ex axillis foliorum inferiorum exortae, sessiles, globoso-capitatae, circiter 5 mm. diametro, dense pluriflorae; bracteae floribus breviores, fere orbiculares, circiter 3 mm. longae et latae, scariosae. *Flores* albi, nitentes; pedicellus cum ovario 2–2.5 mm. longus. *Sepala* oblongo-elliptica, lateralia leviter obliqua, 2.5 mm. longa, 1.5 mm. lata, apice rotundata. *Petala* elliptico-obovata, apice rotundata vel obtusissima, fere 2.5 mm. longa, 1.5 mm. lata. *Labellum* obscure trilobatum, late reniformi-ovatum, apice rotundatum, 1.75 mm. longum, 2.25 mm. latum, lobis lateralibus rotundatis columnam basi amplectentibus; calcar fere globosum, 1.25 mm. longum et diametro, fere pellucidum. *Columna* brevis, crassa, vix 1 mm. alta, truncata, androclinio leviter excavato; anthera ± hemisphaerica, antice brevissime producta et truncata; pollinia pyriformi-globosa, stipitibus 2, apice subspathulato-dilatatis 0.25 mm. longis, viscidio ligulato antice implicato 0.5 mm. longo; rostellum descendens, quarta parte apicali hamato-implicatum, apice obtusum, in toto circiter 0.5 mm. longum, viscidio amoto fere ad basin tripartitum, partitio intermedia dentiformis quam laterales multo brevior; fovea stigmatica quadrato-orbicularis.

Characterised by the short leaves and small flowers which are about the same size as those of *A. Straussii* (Schltr.) Schltr. The lip, however, is much broader than in that species, while the spur is almost globular and shorter than the lip. In *A. parviflorus* the rostellum, although agreeing in general features with that of the other species of the genus, is turned up for only a short distance at the apex.

Tanganyika Territory: Amani, 3000 ft. alt., on mossy bole of rain forest tree, July 1941, *Moreau 70.*

10. **Ancistrorhynchus recurvus** *Finet* in Mém. Soc. Bot. France 9 (1907) 46, t. IX, fig. 15–27—Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 138.

Ancistrorhynchus clandestinus Summerhayes in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 462, *pro minima parte.*

This species, which I consider to be the type of the genus, resembles *A. clandestinus* (Lindl.) Schltr., but the leaves are consistently shorter and relatively broader while the lobes are less unequal and subacute or almost rounded and very shortly lobulate. Florally the species has the trilobed lip, somewhat S-shaped spur and only slightly bilobed pollinarium stipes of *A. clandestinus.*

French Guinea: Between Timbo and Conakry, *Pobéguin 788* (not seen).

Gold Coast: Between Assin and Yan Kumassi, *Cummino 87.*

Gabon: Fernand Vaz, *Lecomte* (Type); Lambaréné, *Thollon* (not seen); Koulamotou, Upper Ogoué River, *Le Testu 7997.*

11. **Ancistrorhynchus refractus** (*Kraenzlin*) *Summerhayes comb. nov.*

Listrostachys refracta Kraenzlin in Engler Bot. Jahrb. 33 (1902) 74.

Cyrtorchis refracta Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 132.

It is difficult to see why Schlechter referred this species to *Cyrtorchis* since Kraenzlin described clearly the

characteristic *Ancistrorhynchus* rostellum and the general structure of the flower is quite unlike that of *Cyrtorchis*. *A. refractus* is very close to, if not identical with, *A. laxiflorus* Mansf., from which it differs in the longer and narrower lip with the base widened to form rather obscure side-lobes, and in the shape of the spur. This tapers gradually from the mouth to the narrowest part whereas in *A. laxiflorus* it tapers very little until it is suddenly contracted to a narrow neck just below the apical swelling. It still remains doubtful if these differences are really specific.

Tanganyika Territory: Usambara, Derema, *Scheffler 123* (Type, not seen): Amani, *Zimmermann*.

12. **Ancistrorhynchus Straussii** *Schlechter* in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 139.

Angraecum Straussii Schlechter in Engler Bot. Jahrb. 38 (1906) 164—Rendle Cat. Talb. Nig. Pl. (1913) 106, 146.

Cephalangraecum Straussii Summerhayes in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 462.

Easily recognisable by the narrow and relatively short leaves and the small flowers, the perianth members being less than 2.5 mm. long. In column structure the species agrees with the other members of the genus.

Nigeria: Oban, *Talbot 940;* Moliwe, *Schlechter 15771* (Type); Eket, *Talbot*.

Belgian Congo: Ituri Forest, *Chandler 2448*.

In addition to and evidently quite distinct from the above twelve species is a fruiting gathering (*Mann 2123*) from 5000 ft. altitude on the Camerooms Mountain doubtfully referred to *A. Metteniae* (Kraenzl.) Summerh. (sub *Listrostachys Braunii* Dur. & Schinz) by Rolfe in the Flora of Tropical Africa (vol. 7, p. 167). This has short strap-shaped leaves with slightly unequal rounded apices which are very finely denticulate-serrate.

NOTES ON PERUVIAN ORCHIDS

BY

CHARLES SCHWEINFURTH

In the course of my study of the orchid flora of Peru, the following amplifications and alterations appeared to be advisable.

Koelensteinia peruviana *Schlechter* in Orchis 12 (1918) 28.

In consideration of a collection, *McCarroll 84*, which is surely referable to this species, as well as a minute examination of a photograph of the type collection, *Ule 6691*, it seems advisable to publish certain additional data and corrections to the published description.

The description of *K. peruviana* specifies an abbreviated rhizome and aggregated pseudobulbs, whereas *McCarroll 84* has the pseudobulbs separated a distance of 4 cm. on a stout sheathed rhizome. Of greater importance, the pseudobulbs of this collection, as well as those of the type of *K. peruviana* and of *K. ionoptera* Linden & Reichb. f., are surmounted by a long slender caulescent neck which may reach a length of 13.5 cm. The petiole of the leaf appears to be elongate and up to 11.5 cm. long. The floral segments are smaller than specified, the sepals being about 11.2 mm. long (as in the type of *K. peruviana*) and not 14 to 15 mm. long as described. They are oblong-elliptic, elliptic or ovate as shown in the photograph of the type, scarcely oblong or ligulate-oblong as described. Finally, the lip is only about 6.2 mm. long and not 12 mm. long as described, and is not broadly clawed but sessile and articulated to the free portion of the column-foot.

PERU: Dept. Puno, Sandia, Sta. Domingo area, at 1550 meters altitude, December 22, 1940, *D. McCarroll 84*.

Chondrorhyncha lojae (*Schlechter*) *C. Schweinfurth comb. nov.*

Kefersteinia Lojae Schlechter in Fedde Repert. Beih. 8 (1921) 93; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 95, nr. 373.

Apparently the only discrepancy between the concept ***Kefersteinia*** and the earlier genus *Chondrorhyncha* rests in the presence in ***Kefersteinia*** of a longitudinal keel on the anterior face of the column which character is apparently lacking in *Chondrorhyncha*. I believe that this difference is not only inconsequential but often obscure and that ***Kefersteinia*** should become a synonym of *Chondrorhyncha*.

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NOTES ON TROPICAL AMERICAN ORCHIDS II

BY

CHARLES SCHWEINFURTH

IN THE COURSE of investigations on the orchids of Peru, the following reductions, discussions, amplifications and nomenclatorial notes were found to be advisable.

Gomphichis plantaginifolia *C. Schweinfurth nom. nov.*

Stenoptera plantaginea Schlechter in Fedde Repert. 10 (1912) 446; ex Mansfeld in Fedde Repert. Beih. 58 (1930) t. 13, nr. 50.

Gomphichis (as *Gomphiches*) *plantaginea* Schlechter in Fedde Repert. Beih. 10 (1922) 60, non *G. plantaginea* Schlechter in Fedde Repert. Beih. 9 (1921) 50.

Since the epithet, *plantaginea*, is illegitimate as it had already been used in the genus *Gomphichis* at the time when *Stenoptera plantaginea* was referred to that genus, the above new name is proposed.

This species, which was originally described from Bolivian material, now appears to be frequent in Peru, where it occurs in the Departments of Ayacucho, Cuzco and Puno.

Gomphichis plantaginifolia differs from the Peruvian *G. plantaginea* in having a very densely flowered raceme and flowers with much narrower petals and dissimilar lip.

Lanium microphyllum (*Lindl.*) *Bentham* in Hooker Ic. Plant. 14 (1881) t. 1334—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1898) 28.

Epidendrum microphyllum Lindley in Hooker Journ. Bot. 3 (1841) 85.

Lanium peruvianum Schlechter in Fedde Repert. Beih. 9 (1921) 97; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 123, nr. 481.

The superposed arrangement of the ovoid (not compressed) pollinia shows clearly that the concept *Lanium* is distinct from the genus *Epidendrum*.

Judging from the description and floral analysis of *Lanium peruvianum*, this concept is inseparable from the variable *L. microphyllum*.

Epidendrum brachyphyllum *Lindley* Fol. Orch. Epidendrum (1853) p. 72, no. 225.

Epidendrum Lindenii Lindley in Bot. Reg. 31 (1845) Misc. p. 48, no. 59; Fol. Orch. Epidendrum (1853) p. 72, no. 227, non *E. Lindenii* Lindley in Ann. & Mag. Nat. Hist. 12 (1843) 397.

Epidendrum cuzcoense Schlechter in Fedde Repert. Beih. 9 (1921) 82; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 117, nr. 460.

Epidendrum tarmense Schlechter in Fedde Repert. Beih. 9 (1921) 94; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 122, nr. 477.

Epidendrum inconstans Ames in Bull. Torr. Bot. Club 58 (1931) 350.

Judging from a record of the type of the Bolivian *Epidendrum brachyphyllum* bearing an analytical drawing from the Lindley Herbarium at Kew, this concept includes the *Epidendrum Lindenii* which Lindley described in the Botanical Register of 1845. The latter concept is represented in our herbarium by a photograph of the type

specimen and a flower from this collection as well as by a specimen (*Fendler 1452*) cited as *E. Lindenii* by Cogniaux (in Mart. Fl. Bras. 3, pt. 5 (1898) 132). In the Ames Herbarium are also a large number of South American collections which have been referred to *Epidendrum Lindenii* originating from Venezuela (the type locality), Colombia, Ecuador and Brazil.

Epidendrum brachyphyllum was described from a single small specimen about 15 cm. tall with rose-colored flowers. Its only notable difference from *E. Lindenii* is that the lateral divisions of the callus on the lip in *E. brachyphyllum* appear to be simple, whereas they are more or less bilobulate in *E. Lindenii*. The latter species seems to be very variable both vegetatively (in height, stature, width of leaves, etc.) and florally (in the width of the petals and in the degree of laceration of the lobes of the lip).

The Peruvian *Epidendrum cuzcoense* is a large species 1 to 2 meters tall with leaves about twice as large as those of *E. brachyphyllum* (but of about the same proportions) and slightly larger orange flowers. The petals are broad and similar to those of *E. brachyphyllum* and the callus of the lip seems to resemble that of *E. Lindenii*.

Epidendrum tarmense, also from Peru, is almost or quite as large a plant as *E. cuzcoense*. The flowers, which are brick-red are almost exactly the same size and form as those of *E. cuzcoense*, but the petals are somewhat narrower and the lobes of the lip of slightly different proportion.

Epidendrum inconstans was used by Ames to designate *E. Lindenii* (1845), since the latter epithet was a homonym of *E. Lindenii* (1843).

This variable and much collected species occurs widely in the northwestern parts of South America. The flowers range from golden yellow or orange to scarlet and

various shades of pink, and rarely maroon or white forms occur.

Epidendrum xanthinum Lindl. with yellow flowers is a species very closely allied to *E. brachyphyllum*, but it appears to have a dissimilar less distinctly lobed callus on the lip.

Epidendrum catillus *Reichenbach filius & Warscewicz* in Bonpl. 2 (1854) 112.

Epidendrum vinosum Schlechter in Fedde Repert. Beih. 9 (1921) 96; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 122, nr. 480.

The Colombian *Epidendrum catillus*, which was described from a pedunculed inflorescence only, is represented in the Ames Herbarium by several drawings (with analyses of the lip) from the Reichenbach Herbarium in Vienna. The mid-lobe of the lip is shown as subquadrate-obovate and apiculate as described; but the basal crenulate callus is depicted as scarcely exceeding the base of the mid-lobe whereas it is described as extending from the base to the apex of the mid-lobe.

In the Peruvian *E. vinosum*, of which I have seen several examples, the mid-lobe of the lip is ovate-lanceolate or "oblong-linguiform" (as described) and more or less abruptly acute. In these examples the crenulate callus is produced to about the middle of the mid-lobe or slightly above, whereas it is described and illustrated as scarcely produced above the base of the mid-lobe. In an Ecuadorian collection reasonably referred to *E. catillus*, however, the mid-lobe is rather subquadrate with a truncate and apiculate apex and thus appears to be of a form intermediate between *E. catillus* and *E. vinosum*.

As is characteristic of this group of Epidendrums, there is considerable variation in the exact formation of the details of the lip. Accordingly, it seems advisable to include *E. vinosum* in the concept *E. catillus*.

Epidendrum cornutum *Lindley* in Hooker Journ. Bot. 3 (1841) 86; Fol. Orch. Epidendrum (1853) p. 48, no. 149.

Epidendrum anthoceros Linden & Reichenbach filius in Bonpl. 2 (1854) 281.

Epidendrum Pavonianum Reichenbach filius in Bonpl. 4 (1856) 215.

Epidendrum melinoaeron Schlechter in Fedde Repert. Beih. 9 (1921) 88; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 119, nr. 468.

Epidendrum anthoceros, of which I have seen a drawing (with analysis of the lip) made from the type in the Reichenbach Herbarium in Vienna, appears closely to resemble *E. cornutum*, as represented by a photograph of the latter species (bearing an analytical drawing of the lip) from the Lindley Herbarium at Kew. It has leaves very similar to the more robust Colombian specimen of *E. cornutum* which was mounted on the same sheet with the type, but has a more elongate raceme than is shown by even the more slender type of *E. cornutum*. The only notable difference between these concepts, however, is that *E. anthoceros* is represented as having minutely denticulate acute lateral lobes of the lip, whereas those of *E. cornutum* are shown as entire and rounded at the apex. In *Weberbauer 6300*, previously identified as *E. anthoceros*, the lateral lobes are obscurely denticulate but rounded at the apex. Thus it appears reasonable to neglect these minute characters as of insufficient diagnostic weight.

Epidendrum Pavonianum Reichb.f., represented in the Ames Herbarium by a drawing (with analysis of the lip) from the Reichenbach Herbarium, appears to have somewhat shorter broader leaves than the otherwise similar *E. cornutum*. The lateral lobes of the lip, which are represented as entire and rounded, are described and shown as thickened inside the margins.

Epidendrum melinoaeron is typified by *Weberbauer 6300*, which collection was, as stated above, formerly identified as *E. anthoceros* Lind. & Reichb.f. Like the latter concept, it has the rounded lateral lobes of the lip with denticulate margins and it resembles *E. Pavonianum* in having dorsally carinate sepals and centrally thickened lateral lobes of lip—characters which are not mentioned in either *E. cornutum* or in *E. anthoceros*.

Considering the evident variability of *E. cornutum* as interpreted by Lindley and the apparently obscure characters of the lateral lobes of the lip in the allied forms, it seems best to treat these concepts as variants of one polymorphic species.

Epidendrum crassilabium *Poeppig & Endlicher* Nov. Gen. ac Sp. 2 (1838) 1, t. 102.

Epidendrum variegatum Hooker in Bot. Mag. 59 (1832) t. 3151, nec Sw. (1788) nec Koen. in Retzius (1791).

Epidendrum saccharatum Kränzlin in Orchis 2 (1908) 113, fig. 17.

It appears, from a careful study of the description of *E. saccharatum* from British Guiana, that this concept is referable to the extremely variable *E. crassilabium* which is more generally known as *E. variegatum*. Slight discrepancies occur in the elongate creeping rhizome, the somewhat broader leaves and the more elongate pedicellate ovaries attributed to *E. saccharatum*.

The full synonymy of this species is given in Ames, Hubbard & Schweinfurth The Genus Epidendrum in the United States and Middle America (1936) 85.

Epidendrum cristatum *Ruiz & Pavon* Syst. Veg. (1798) 243.

Epidendrum raniferum Lindley Gen. & Sp. Orch. Pl. (1831) 109; Fol. Orch. Epidendrum (1853) p. 53, no. 167.

Epidendrum validum Schlechter in Fedde Repert. Beih. 9 (1921) 95; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 122, nr. 479.

An examination of typical material of the heretofore obscure species, *Epidendrum cristatum*, has convinced me of the identity of this concept with the widespread plant commonly known as *E. raniferum* Lindl. *E. cristatum* apparently does not differ from the usual forms of this variable concept except in having more deeply divided lateral divisions of the lip. These lateral lobes consist of four divisions of which the posterior one is obliquely ovate-lanceolate and the three anterior divisions linear, spreading and successively longer toward the front.

Full synonymy of *Epidendrum raniferum* is given in Ames, Hubbard & Schweinfurth The Genus Epidendrum in the United States and Middle America (1936) 166.

Epidendrum densifolium *Kränzlin* in Fedde Repert. 1 (1905) 186.

There has recently come to hand a specimen which must be referred to *E. densifolium*. It agrees well with the type collection (of which I have seen an excellent photograph) except that the leaves appear to be slightly smaller and the inflorescence consists of a spreading panicle rather than of a "raceme" as described. The detached flower-cluster which appears in the type specimen is probably a branch of a panicle and shows a strongly fractiflex rachis, whereas the rachis of the branches of the panicle in my specimen are at most slightly so.

Peru: Department of Ayacucho, Prov. Huanta, mountains northeast of Huanta, on rocks in moist ravine, at 3100–3200 meters altitude, flowers greenish yellow, February 1–10, 1926, *A. Weberbauer 7507*.

Epidendrum difforme *Jacquin* Enum. Pl. Carib. (1760) 29 and Select. Stirp. Am. (1763) 223, t. 136.

Epidendrum apaganum Mansfeld in Notizbl. Bot. Gart. & Mus. Berl. 10 (1928) 240.

The features which appear to distinguish *E. apaganum* from its allies are the robust growth, the oval-oblong emarginate leaves and certain features of the lamina of the lip notably the irregularly dentate outer sides of the lateral lobes and the entire obtuse terminal lobe.

The leaf-form shown by the type of *E. apaganum* coincides well with that illustrated for *E. difforme* in Jacquin Select. Stirp. Am. t. 136. Furthermore, a Peruvian collection (*Klug 0.5* from the Department of Loreto) has an exactly similar growth and even larger leaves than those of *E. apaganum* as well as a lip with precisely the measurements of that species; yet it has the lobing of the lip with the subentire sides and the transverse emarginate mid-lobe of typical *E. difforme*. Frequently the outer sides of the lateral lobes of *E. difforme* are somewhat dentate and the mid-lobe of this polymorphic species is sometimes simple and obtuse as shown in the instance of *E. apaganum*.

Considering the almost inconceivable variability of *E. difforme*, it appears wise not to recognize another questionable segregate in this immediate alliance.

For the full synonymy of *E. difforme*, reference should be made to Botanical Museum Leaflets Harvard University 2 (1934) 50–55.

Epidendrum fimbriatum *HBK.* var. **rhomboglossum** (*Kränzl.*) *C. Schweinfurth var. nov.*

Epidendrum rhomboglossum Kränzlin in Engler Bot. Jahrb. 54, Beibl. 117 (1916) 28.

Epidendrum integrilabium Ames & Schweinfurth in Sched. Orch. 8 (1925) 46.

An examination of isotype material of *Epidendrum rhomboglossum* (Weberbauer 6734) in the Gray Herbar-

ium, in the Herbarium of the Field Museum and in the United States National Herbarium has convinced me that this concept has its only marked difference from the variable *E. fimbriatum* in the entire or subentire (not deeply fimbriate-dentate) margins of the lip. In addition, this concept sometimes has larger leaves (up to 5.85 cm. long), often has larger flowers (sepals up to 8 mm. long), and the more strongly ovate lip is in varying degree longer than broad. Although *E. rhomboglossum* was treated as a synonym of *E. fimbriatum* by Schlechter in his orchid flora of Peru (in Fedde Repert. Beih. 9 (1921) 147), it seems preferable to consider this entire-lipped form as a well-marked variety of *E. fimbriatum*.

This conclusion is strengthened by the fact that the Bolivian *Epidendrum integrilabium*, which was specifically separated from *E. fimbriatum* by the entire margins of the lip, is nearly identical with *E. rhomboglossum*. In *E. integrilabium* the lip tends to be ovate or rhombic-ovate rather than suborbicular in outline (as in *E. fimbriatum*), and thus approaches the lip of *E. rhomboglossum* which is more distinctly narrowed above the middle, or lanceolate-ovate.

Epidendrum Friderici-Guilielmi *Warscewicz & Reichenbach filius* in Bonpl. 2 (1854) 110; in Xen. Orch. 1 (1856) 158, t. 51—Cogniaux Dict. Ic. Orch. Epidendrum (1899) t. 12.

Epidendrum Huacapistanae Kränzlin in Fedde Repert. 1 (1905) 183.

Judging from the description and an excellent photograph of the type of *Epidendrum Huacapistanae* in the Ames Herbarium, it seems clear that this concept represents a small form of *E. Friderici-Guilielmi* as exemplified by a photograph of authentic material of that species (presumably from the Reichenbach Herbarium) and by a Bolivian collection, *Cardenas 1372*.

The leaves of *E. Frideriei-Guilielmi* appear to range from oblong-elliptic to oblong-obovate and from 15 to 28 cm. long and as much as 8 cm. wide, while those of *E. Huacapistanae* are oblong-lanceolate or oblong-elliptic and up to 14 cm. long and 2.5 cm. wide. The raceme of *E. Huacapistanae* is also much shorter than that shown by *E. Frideriei-Guilielmi;* but its floral segments, while markedly smaller than those of typical *E. Frideriei-Guilielmi*, seem to be of almost exactly the same form, contour and color in the two concepts. Moreover, the two species were collected at nearly the same altitude. The Bolivian specimen referred to is a vegetatively large plant of quite the aspect and size of typical *E. Frideriei-Guilielmi* but with budded flowers whose segments are intermediate in size between the two forms.

Epidendrum frigidum *Linden ex Lindley* in Bot. Reg. 31 (1845) Misc. p. 76, no. 48; Lindley Fol. Orch. Epidendrum (1853) p. 89, no. 286.

Epidendrum macrodonae Schlechter in Fedde Repert. Beih. 9 (1921) 88; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 119, nr. 467.

A collection from Cuzco, Peru (*Herrera 2119*) is surely referable to the Venezuelan *Epidendrum frigidum* which is represented in the Ames Herbarium by a photograph of the type bearing an analytical drawing of the lip. It differs from this type, however, in having apparently larger flowers with a verrucose outer surface to the sepals—a character which is not mentioned in the type. The dorsal sepal, which is lanceolate-oblong, is about 11 mm. long and the obliquely lanceolate lateral sepals are about 12 mm. long.

The Peruvian *Epidendrum macrodonae* from Huánuco, which reaches a height of 3 meters, varies from the Herrera collection of *E. frigidum* only in having somewhat

smaller flowers (sepals 8 mm. long), broader (ovate-oblong) dorsal sepal and obtuse (not acute nor acuminate) lip.

This species occurs in Peru (Cuzco and Huánuco (type of *E. macrodonae*)), Venezuela (type of *E. frigidum*) and perhaps Colombia (Pasto).

Epidendrum frigidum *Linden ex Lindley* var. **stenophyton** (*Schltr.*) *C. Schweinfurth var. nov.*

Epidendrum stenophyton Schlechter in Fedde Repert. Beih. 9 (1921) 93; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 121, nr. 476.

This concept differs from *E. frigidum* only in outward appearance. Its stems are either simple (as in *E. frigidum*) or branched and they are much more slender, having a diameter of 4 mm. or less across the leaf-sheaths, whereas those of *E. frigidum* are about 10 mm. across. The leaf-sheaths are finely verruculose in the variety, whereas they appear to be merely rugulose in *E. frigidum*. The leaves of var. *stenophyton* are small, being 5.6 cm. or less long and 8 mm. or less wide, whereas they are much larger in *E. frigidum*. The inflorescences of var. *stenophyton* are always abbreviated and usually (but not always) racemose, whereas in *E. frigidum* they are invariably paniculate with commonly elongate branches. The flowers of this concept are slightly smaller than in *E. frigidum* and they vary from greenish white (sometimes with a faint pink tinge) to pale yellow, whereas those of *E. frigidum* are pale rose-colored.

This variety is apparently well distributed in Peru, being found in Amazonas (type of *E. stenophyton*), Cuzco and Huánuco. It seems quite likely that the Jameson collection from Pasto (Colombia) cited as a form of *E. frigidum* by Lindley (Fol. Orch. Epidendrum p. 89) as "weak and racemose, not panicled," should be referred to this variety.

Epidendrum geminiflorum *Humboldt, Bompland & Kunth* Nov. Gen. et Sp. 1 (1816) 354—Lindley Fol. Orch. Epidendrum (1853) p. 49, no. 155.

Epidendrum cajamarcae Schlechter in Fedde Repert. Beih. 9 (1921) 81; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 117, nr. 459.

After careful comparison of the type description of *E. geminiflorum*, supplemented by photographic records of collections in the Lindley Herbarium identified as representing that species, with the description and floral analysis of *E. cajamarcae*, it is my opinion that the two concepts are synonymous and that Kränzlin was correct in so identifying *Weberbauer 4102* (the type of *E. cajamarcae* Schltr.).

An Ecuadorian collection (attributed to *E. geminiflorum* by Lindley) on the same sheet with apparently topotype material of that species from Popayan (Colombia) has the slightly larger flowers with less acuminate sepals and petals specified for *E. cajamarcae*. It seems highly probable that the more acuminate character of the sepals in *E. geminiflorum* may be largely due to their revolute nature. Otherwise the discrepancies between the concepts appear to be unimportant, all the more so in comparing the lip of *E. geminiflorum* as drawn by Lindley with that of *E. cajamarcae* as depicted by Schlechter.

Epidendrum Hartwegii *Lindley* in Bentham Pl. Hartweg. (1844) 150; Fol. Orch. Epidendrum (1853) p. 36, no. 113.

Epidendrum fuscum Schlechter in Fedde Repert. Beih. 9 (1921) 84; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 118, nr. 463.

Judging from the description and a floral analysis of *Epidendrum fuscum* made under the direction of Dr. Schlechter, this species cannot reasonably be separated

from *E. Hartwegii*. I have seen a drawing of the flower of the latter species traced from Lindley's sketch on the type sheet, as well as specimens from Venezuela and Colombia identified as *E. Hartwegii*.

The Peruvian collections which I identify as representing *E. Hartwegii* differ from the more carefully described *E. fuscum* in having somewhat larger vegetative proportions throughout. The plant, which shows a creeping rhizome, averages about 30 cm. high from the rhizome. The pseudobulbs range from 9.5 to 17 cm. (instead of 6.5–8 cm.) tall; the leaves vary from 15 to 20 cm. (instead of 10–14 cm.) long and 1.2–2.2 cm. wide. One raceme appears to have about fourteen (instead of six to nine) flowers. The floral outline and measurements, however, seem to be nearly identical with those of *E. fuscum*.

Epidendrum ibaguense (as *ybaguense*) *Humboldt, Bompland & Kunth* Nov. Gen. et Sp. Pl. 1 (1816) 352.

Epidendrum radicans Pavon ex Lindley Gen. & Sp. Orch. Pl. (1831) 104; Fol. Orch. Epidendrum (1853) 70, no. 220.

Epidendrum decipiens Lindley Fol. Orch. Epidendrum (1853) 70, no. 221.

Epidendrum chrysostomum Reichenbach filius in Allgem. Gartenz. 24 (1856) 98.

Epidendrum lactum Schlechter in Fedde Repert. Beih. 6 (1919) 37; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 5, nr. 19.

Epidendrum Baumannianum Schlechter in Fedde Repert. Beih. 7 (1920) 126; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 44, nr. 169.

Epidendrum fraternum Schlechter in Fedde Repert. Beih. 7 (1920) 133; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 47, nr. 180.

Epidendrum Smithii Schlechter in Fedde Repert. Beih.

7 (1920) 149; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 53, nr. 203.
Epidendrum sororium Schlechter in Fedde Repert. Beih. 7 (1920) 150; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 53, nr. 204.
Epidendrum huanucoense Schlechter in Fedde Repert. Beih. 9 (1921) 86; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 118, nr. 465.

A flower which was recently loaned to me from the type of the Colombian *Epidendrum ibaguense* and a photograph of that species from the Muséum d'Histoire Naturelle in Paris show that it is synonymous with *E. radicans* as represented by a photograph of the type specimen from the British Museum of Natural History in London, and by numerous specimens in the Ames Herbarium from Mexico and Central America. The only notable difference between the concepts is that *E. radicans* generally has long whitish roots proceeding from the stem (commonly opposite the leaf-joints), whereas in *E. ibaguense* no such roots appear. Furthermore, some specimens of *E. radicans* are apparently destitute of these roots. It appears, moreover, that many examples of *E. radicans* have petals which are broader than the sepals, rather than narrower, but this character is variable and not typical of the species. Both concepts have orange to vermilion flowers. For the synonymy of *E. radicans*, see Ames, Hubbard & Schweinfurth The Genus Epidendrum in the United States and Middle America (1936) 162.

Judging from a photograph of the type and co-type of *Epidendrum decipiens* in the Ames Herbarium, this concept also cannot reasonably be separated from *E. ibaguense*. This South American species also has orange flowers.

In the drawing of the Peruvian *Epidendrum chrysostomum* from the Reichenbach Herbarium in Vienna, the

lateral lobes of the lip are represented as obliquely and broadly subquadrate from a cordate base. Therefore, they seem to be quite similar to those of typical *E. ibaguense* even though these structures are described as ligulate. The leaves are said to exceed 10 cm. in length, whereas they are represented in the drawing as 6 cm. or less long (like the leaves shown in *E. ibaguense* and *E. radicans*). As figured, the flowers appear to be of approximately the size and quite the same form as those of *E. ibaguense*, and are described as dark garnet-red with a yellow lip.

The Venezuelan *Epidendrum lactum*, of which I have seen a drawing and analysis of the type (made under the supervision of Dr. Schlechter), seems to be very close to typical *E. ibaguense* but with slightly larger bright purple flowers. The lateral lobes of the lip are coarsely incised-dentate like those of the co-type of *E. decipiens* from British Guiana. The claw of the mid-lobe is rather short, yet distinct.

The Colombian *E. Baumannianum*, represented also by a floral analysis made under the supervision of Schlechter, appears to be inseparable from *E. ibaguense*. The leaves are somewhat larger, but the flowers (of which there are no color-notes) are almost identical with that species save that the sepals and petals are subobtuse and not acute nor acuminate.

Epidendrum fraternum from Colombia, illustrated by a floral analysis made under the supervision of Schlechter, is a small-leaved species having nearly the same floral segments as some forms of *E. radicans*. The lip which is rather shorter than that of *E. ibaguense* has lacerate-dentate lateral lobes and the short subquadrate mid-lobe is little dilated at the apex. The presence of even this short claw on the mid-lobe inclines me to place this concept as a synonym of *E. ibaguense* rather than of its variety *confluens*. No color notes are given.

The Colombian *Epidendrum Smithii* (represented by a photograph of typical material, a flower from the type and a floral analysis by Schlechter), is morphologically inseparable from typical *E. ibaguense*, but has much smaller bright rose-purple flowers.

Epidendrum sororium, also from Colombia and represented in the Ames Herbarium by a floral analysis made by Schlechter, is a species with small leaves and rather small flowers. The petals which are lanceolate-elliptic and the lip which has a subquadrate mid-lobe with only a slight apical dilation, are very similar to those of many specimens of the variable *E. radicans*.

Epidendrum huanucoense, from Peru, is described as a tall plant (about 150 cm. high) but has small rose-colored flowers of almost exactly the same size and form as those of *E. Filomenoi*. Indeed the single notable difference between these species is that the mid-lobe of the lip appears to have an abbreviated claw or isthmus which places it as a synonym of *E. ibaguense* rather than of var. *confluens*.

Epidendrum ibaguense *HBK.* var. **confluens** (*Lindl.*) *C. Schweinfurth var. nov.*

Epidendrum fulgens Brongniart in Duperr. Voy. Coquille Bot. Phan. (1834) 196, t. 43—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1898) 121.

Epidendrum Schomburgkii Lindl. var. *confluens* Lindley Fol. Orch. Epidendrum (1853) p. 70, sub no. 219.

Epidendrum calanthum Reichenbach filius & Warscewicz in Bonpl. 2 (1854) 111.

Epidendrum paytense Reichenbach filius in Bonpl. 3 (1855) 220.

Epidendrum pristes Reichenbach filius in Gard. Chron. n.s. 26 (1886) 262.

Epidendrum cauca Schlechter in Fedde Repert. Beih.

7 (1920) 127: ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 45, nr. 171.

Epidendrum Filomenoi Schlechter in Fedde Repert. Beih. 9 (1921) 83; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 117, nr. 461.

This variety is separated from the species by the sessile or indistinctly clawed mid-lobe of the lip which varies in size in relation to the lateral lobes.

Epidendrum fulgens (from Brazil, British Guiana and Trinidad) has brilliant purple flowers which are a little larger than in typical *E. ibaguense*. The petals are broadly oblong-elliptic to obovate and more or less entire; the lip has broadly rounded denticulate lateral lobes and a much smaller cuneate-retuse denticulate mid-lobe. Its proportions appear to be variable.

Epidendrum Schomburgkii var. *confluens* is a combination made by Lindley to represent *E. fulgens* Brongn. which he thought to be a variant of *E. Schomburgkii*. Being the first varietal designation of this alliance, the epithet must be conserved.

The type of *Epidendrum calanthum* was described from only the upper part of a plant consisting of two more or less branched inflorescences with their flowers. In the sketch of this concept from the Reichenbach Herbarium in Vienna, the sepals and petals, which are described as oblong and acute, appear to be closely similar to those of *E. ibaguense*. The sessile mid-lobe of the lip is obcordate and seems to be at least equally large with the lateral lobes. No notes of color are cited. Originally described from Peru, this concept occurs on the island of Guadeloupe and in Colombia. The latter collection (*Lehmann 8177*) differs from the type in having elliptic or oblong-elliptic petals and a prominently arcuate column.

The Peruvian *Epidendrum paytense*, exemplified in the Ames Herbarium by several drawings from the

Reichenbach Herbarium, is apparently a similar species with oblong-ovate to oblong leaves which are described as cartilaginous-denticulate on the margin (a character which is more or less marked in all specimens of this alliance which I have examined). The sepals are shown as elliptic-lanceolate and the petals which are described as broader than the sepals, are lanceolate-elliptic or "cuneate-rhombic" and minutely denticulate above. The lip appears to be very similar to that of *E. calanthum* except that the rounded lobules of the mid-lobe are described and sometimes shown as overlapping. The color is noted as vermilion, the lip being yellow and vermilion (or yellow with few dark purple spots).

Epidendrum pristes, described from a cultivated specimen of uncertain origin, is a slender plant with leaves minutely serrate. The drawing of an expanded flower, from the Reichenbach Herbarium, shows vermilion elliptic-lanceolate sepals and petals, the latter being serrate above. The yellow vermilion-spotted lip has semiorbicular irregularly dentate lateral lobes and a smaller cuneate retuse mid-lobe. It appears to be very similar in form to the lip of *E. fulgens* Brongn.

The Colombian *Epidendrum cuneae*, represented in the Ames Herbarium by a floral analysis made by Schlechter, is a tall plant with adventitious roots as in *E. radicans*, small leaves and orange flowers which are slightly larger than in typical *E. ibaguense* and very similar to those of *E. fulgens*. The elliptic petals have slightly crenulate upper margins. The lip has an outline very similar to that of *E. fulgens* with a mid-lobe which is relatively small and cuneate-flabellate.

Epidendrum Filomenoi, from Peru, is described as a small plant up to 20 cm. high, with small rose-colored flowers. The petals, which are elliptic-oblong and narrower than the sepals, have crenulate or erose margins.

The lip has a form very similar to that represented for the lip of *E. calanthum*. Among several Peruvian specimens referable to this form, one plant is over 69 cm. high (stem incomplete) with broadly elliptic-oblong leaves up to 8 cm. long and 2.75 cm. wide. Other collections have small ovate or narrow lanceolate-oblong leaves. In some cases, the lamina of the lip appears to be irregularly deep-lacerate or lacerate on one side and lobed on the other, rather than distinctly 3-lobed.

Epidendrum ibaguense *HBK.* var. **Schomburgkii** (*Lindl.*) *C. Schweinfurth var. nov.*

Epidendrum Schomburgkii Lindley in Bot. Reg. 24 (1838) Misc. p. 15, no. 16 & t. 53; Fol. Orch. Epidendrum (1853) p. 70, no. 219—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1898) 120.

Epidendrum fulgens Focke in Tijdschr. Nat. Wetensch. 4 (1851) 66, non *E. fulgens* Brongn.

Epidendrum splendens Schlechter in Fedde Repert. Beih. 9 (1921) 93; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 121, nr. 475.

This variety differs from the species in the prominently acute or apiculate termination of the mid-lobe of the lip and in the acuminate or subacuminate sepals and petals. The flowers are commonly distinctly larger than in the other forms of this variable group.

A flower preserved on the type sheet of *Epidendrum Schomburgkii* in the Lindley Herbarium shows sepals and petals which are strongly acuminate and a mid-lobe of the lip which is acute or apiculate (described as triangular at the apex). The flowers appear to be somewhat larger than those of typical *E. ibaguense* and they show considerable variation in size. The color of the flowers is said to be scarlet or vermilion.

The Peruvian *Epidendrum splendens* appears to differ

from *E. Schomburgkii* only in its larger flowers. Its sepals are described as about 2.7 cm. long, whereas those of the type of *E. Schomburgkii* measure 1.5 cm. in length. However, other specimens have sepals up to 3 cm. long, and in one Peruvian collection (*Killip & Smith 29181*) referred to *E. Schomburgkii* the petals, which slightly exceed the sepals, are about 3.3 cm. long. The dilated apex of the mid-lobe of *E. splendens* is described and figured as transversely oval, as is the case in some flowers depicted in the plate of typical *E. Schomburgkii*.

In my opinion, *Epidendrum ibaguense* is a highly polymorphic species extending from Mexico through Central America and the West Indies to Brazil, Bolivia and Peru.

Two closely allied species which are perhaps referable to this group are *Epidendrum cinnabarinum* Salzm. and the rather indefinite *E. Mosenii* Reichb.f.

Epidendrum inamoenum *Kränzlin* in Engler Bot. Jahrb. 37 (1906) 525.

A collection which I have recently received from the Field Museum (No. 1051139) is undoubtedly referable to this species of which I have seen an excellent photograph of the type. The discrepancies are so noticeable, however, that it seems worthwhile to record them.

Plant (lacking basal portion of stem) noted as 1 meter high; the type is about 18.5 cm. in height. Leaves up to 8 cm. long and 1.7 cm. wide; the typical blades given as up to 4 cm. long and 1.2 cm. wide. Inflorescence prominently recurved and about 9-flowered; the typical inflorescence is erect or slightly arcuate and only 4- to 5-flowered. Dorsal sepal broadly elliptic, about 11 mm. long and 5.4 mm. wide. Lateral sepals obliquely ovate-elliptic, about 12.2 mm. long and 6 mm. wide; the sepals of the type are described as oblong, 9–10 mm. long and 4 mm. wide. Petals oblanceolate, about 10 mm.

long and 3.6 mm. wide; those of the type cited as oblong, 7–8 mm. long and 3 mm. wide. Lip transversely broad-ovate, about 7.7 mm. long and 10.5 mm. wide; that of the type described as transversely oblong, 7 mm. long, 5–6 mm. broad. There do not appear to be any distinct basal calli in this specimen, while the type is noted as having two basal calli adnate to the column.

Peru: Apurimac, Prov. Andahuaylas, ravine north of Chincheros, at 2800 meters altitude, on shrubby hillside in a mixture of clay and gravel, February 27, 1939, *H. E. Stork & O. B. Horton 10756*.

Epidendrum micranthum *Lindley* in Hook. Journ. Bot. 3 (1841) 88; Fol. Orch. Epidendrum (1853) p. 89, no. 283.

Amblostoma holochilum Schlechter in Fedde Repert. 10 (1912) 387; ex Mansfeld in Fedde Repert. Beih. 58 (1930) t. 40, nr. 158.

In the description as well as in the floral analysis drawn on the sheet of typical *Epidendrum micranthum*, the lip is oblong-quadrate or subquadrate-ovate and naked on the disc. Several Peruvian collections which I have seen recently are obviously inseparable from this species, but have lips which vary from oblong-cordate to rotundate-cordate and are more or less irregularly lobulate, especially in the lower part.

It is evident that the concept described and figured as *Amblostoma holochilum* should not be referred to that genus which is characterized by having subglobose pollinia and a deeply trifid lip. The strongly flattened pollinia place it unmistakably in Epidendrum.

The general aspect and closely similar form and proportions of *Amblostoma holochilum* show that this concept should be included in *Epidendrum micranthum*. Indeed, the only noteworthy discrepancies are that the apex of the lip is lightly retuse and the disc bears a trilobulate

callus—characters which appear, to a more or less marked degree, in some of the Peruvian specimens which are referable to *E. micranthum*.

Epidendrum moyobambae *Kränzlin* in Fedde Repert. 1 (1905) 185.

Epidendrum subpatens Schlechter in Fedde Repert. Beih. 17 (1922) 40; ex Mansfeld in Fedde Repert. Beih. 59, 2 (1931) t. 56, nr. 223.

Epidendrum benignum Ames in Sched. Orch. 2 (1923) 26.

Epidendrum amazonicum Schlechter in Beih. Bot. Centralbl. 42, Abt. 2 (1925) 78.

An excellent photograph of the type of the Peruvian *Epidendrum moyobambae*, together with the description, shows that it includes the concepts heretofore represented by the Central American *E. subpatens* Schltr. and *E. benignum* Ames. At most there are very slight differences in measurements, but none in form.

Epidendrum amazonicum is said to have erect-spreading or subspreading racemes, whereas they vary from subspreading to pendent in the other forms of this concept: otherwise the plant is nearly identical.

It is evident that *Epidendrum patens* Sw. differs widely from all forms of *E. moyobambae* because of its paniculate inflorescences and much smaller flowers. These characters are well set forth by Fawcett & Rendle (Fl. Jam. 1 (1910) 89).

This species extends from Guatemala (?), through Costa Rica and Panama to Trinidad, Colombia, Brazil and Peru.

Epidendrum nephroglossum *Schlechter* in Fedde Repert. Beih. 9 (1921) 89; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 119, nr. 469.

Since the original description of *E. nephroglossum* is

quite misleading when compared with a photograph of the type, with the floral analysis above cited, and with several Peruvian collections referable to this species, it seems desirable to correct the original diagnosis.

Plant epiphytic, variable. Roots fibrous, stout (not filiform), elongate. Stems loosely branching, up to more than 1 meter long according to collector's notes, ascending or arcuate (apparently not suberect as stated), entirely concealed by tubular sheaths which are scarious leafless and evanescent in the lower portions and leaf-bearing above. Leaves three to five in groups, distichous, more or less congested at the summit of the stem or on the short lateral branches, elliptic or oblong-elliptic to oblong-lanceolate (not ligulate), acute to subobtuse, up to 11.8 cm. long and 2.6 cm. wide, clasping at the base. Inflorescence racemose, at first more or less erect, becoming flexuous or pendent in anthesis, up to 13- (not 6-8) flowered, rather loose. Floral bracts ovate or ovate-lanceolate (not elliptic). Flowers green or greenish white to yellow. Dorsal sepal ovate-elliptic (not oblong), up to 1.8 (not 1.1) cm. long and 7.5 mm. wide, acute (not acuminate). Lateral sepals obliquely ovate-lanceolate, rarely elliptic-lanceolate (not oblong), acuminate, up to 2 (not 1.25) cm. long and 9 mm. wide, commonly with a conspicuous dorsal keel. Petals distinctly shorter than the dorsal sepal (not subequal), acute or subacute (not short-acuminate). Lamina of lip suborbicular-cordate to reniform, lightly (not sharply) retuse, up to 9 mm. long in the middle and 1.5 cm. wide.

This species is apparently rather widely distributed in Peru, being recorded from the Departments of Apurimac, Huancavelica, Huánuco and Junín (type), at altitudes ranging from 800 to 3100 meters.

Epidendrum nocturnum *Jacquin* var. **minus** *Cogniaux* in Bull. Soc. Roy. Bot. Belg. 43 (1906) 323.

Epidendrum longicolle Lindley in Bot. Reg. 24 (1838) Misc. p. 34, no. 49; Fol. Orch. Epidendrum (1853) p. 81, no. 255—Hooker in Bot. Mag. 71 (1845) t. 4165.
Epidendrum oliganthum Schlechter in Fedde Repert. Beih. 9 (1921) 90; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 120, nr. 470.
Epidendrum nocturnum Jacq. var. *minor* Schlechter in Fedde Repert. Beih. 27 (1924) 69, probably.

On the sheet in Lindley's Herbarium bearing the type of *Epidendrum longicolle* from British Guiana are specimens from Brazil (San Gabriel, *Spruce 2391*) which have slightly broader (narrowly elliptic-oblong) leaves and smaller flowers than those of the type. All of these have been considered not only by Lindley but subsequently by Cogniaux (in Mart. Fl. Bras. 3, pt. 5 (1898) 134) to represent *E. longicolle* and appear to be a good match for Cogniaux' *E. nocturnum* var. *minus* from Peru.

The character and measurements given for *E. nocturnum* Jacq. var. *minus* also correspond surprisingly well with those of the concept called *E. oliganthum* Schltr., concerning which the author says (in Fedde Repert. Beih. 9 (1921) 90): "Im Habitus erinnert die Art am meisten an *E. nocturnum* L., doch sind die Blüten kaum grösser als bei *E. longicolle* Ldl."

Although no measurements are cited for the Colombian *E. nocturnum* var. *minor* Schltr. (l.c.) and hence no positive means of identification is given, there appears to be little doubt that this form also represents the variety *minus* Cogn.

It therefore seems advisable to treat all these small, slender, narrow-leaved plants with small flowers (all of varying proportions) as representing the var. *minus* of the widely variable *E. nocturnum*.

Epidendrum Porpax *Reichenbach filius* in Bonpl. 3 (1855) 220, non 1865.

Epidendrum Mattheusii Reichenbach filius in Gard. Chron. n.s. 26 (1886) 458 and ser. 3, 2 (1887) 431.

Epidendrum gnomus Schlechter in Fedde Repert. Beih. 9 (1921) 85; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 142, nr. 558.

Epidendrum Mattheusii has already been reduced to the synonymy of *E. Porpax* by Ames, Hubbard & Schweinfurth (The Genus Epidendrum in the United States and Middle America (1936) 152).

On the basis of the description of *E. gnomus* amplified by a floral analysis made under the supervision of Dr. Schlechter, it appears certain that this concept is referable to *E. Porpax* Reichb.f. (1855) which is represented in the Ames Herbarium by a photograph with floral drawings from the Reichenbach Herbarium, as well as by numerous collections extending from Mexico to Venezuela. Apparently this same conclusion was formerly reached by Kränzlin.

There appears to be no morphological difference between these species, the only discrepancy being that *E. gnomus* is smaller vegetatively than the usual plants of *E. Porpax*. However, the latter concept seems to be very variable in size of stem and leaves, and the characterization of *E. gnomus* agrees well with some portions of typical *E. Mattheusii* from Peru.

Epidendrum Ruizianum *Steudel* Nomencl. Bot. ed. 2, pt. 1 (1840) 558.

Epidendrum nutans Ruiz & Pavon Syst. Veg. (1798) 245, non Swartz 1788.

Epidendrum spathaceum Lindley in Hooker Journ. Bot. 3 (1841) 85; Fol. Orch. Epidendrum (1853) p. 53, no. 166.

A photograph of the type of *Epidendrum nutans* Ruiz & Pav. (later renamed *E. Ruizianum* Steud.) shows that

it includes the concept which Lindley described as *E. spathaceum* from fragments "obtained by Mr. Mathews out of the herbarium of Ruiz and Pavon, preserved at Lima." The only difference between these two species appears to be that in *E. spathaceum* there is no indication of leaves, whereas in *E. nutans* Ruiz & Pav. there are oblong-lanceolate or elliptic-oblong obtuse leaves which are 14.5 to more than 16 cm. long and 3–3.5 cm. wide.

A Venezuelan specimen from Merida (*Alfredo Jahn 984*), which represents this species, bears similar leaves up to 23 cm. long and 3.3 cm. wide.

Epidendrum Ruizianum is thus recorded from Venezuela, Colombia and Peru (type).

Epidendrum scabrum *Ruiz & Pavon* Syst. Veg. (1798) 248—Lindley Fol. Orch. Epidendrum (1853) p. 85, no. 271—Reichenbach filius in Bonpl. 4 (1856) 215—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1898) 106.

Epidendrum scabrum Ruiz & Pav. var. *parviflorum* Cogniaux in Martius Fl. Bras. 3, pt. 5 (1898) 107.

Epidendrum loxense Lehmann & Kränzlin in Engler Bot. Jahrb. 26 (1899) 469.

Epidendrum cardiophyllum Kränzlin in Engler Bot. Jahrb. 37 (1906) 523.

The original description of *Epidendrum scabrum* is very brief and inadequate, merely saying: "E. foliis ovato-lanceolatis, marginibus vaginisque scabris, racemo terminali, nectarii labio cruciformi."

Fortunately, however, there is in the Ames Herbarium a photograph of the type of *E. scabrum* from the Madrid Herbarium which shows the following characters. Stem (incomplete below) stout, leafy, apparently densely pustulose. Leaves numerous, distichous, horizontally spreading, with the internodes about 2 cm. long; lamina ovate-lanceolate or ovate-oblong, acute or short-acuminate, clasping at the broadly rounded base, up to 4.3 cm. long

and 1.3 cm. wide. Inflorescence terminal, shortly pedunculed, recurved, loosely paniculate with three subparallel branches which are subdensely many-flowered. Floral bracts lanceolate, acuminate, ascending, apparently much shorter than the slender pedicellate ovary. The only flower which is distinctly shown reveals an oblong, acute dorsal sepal about 8.5 mm. long and an apparently shorter lateral sepal which is obliquely oblong-obovate, acute and basally adnate to the column. A suggestion of a cuneate-spatulate petal is indicated, but no distinct outline of the lip is shown.

The Ecuadorian *Epidendrum loxense*, of which I have seen a specimen of the type number, has pustulose leaf-sheaths, but differs from *E. scabrum* in having smaller ovate leaves up to 2.4 cm. long and 1.3 cm. wide at intervals of 1.5 cm. or less. The inflorescence, which is either racemose or paniculate, has flowers with an oblong-elliptic dorsal sepal about 8.9 mm. long and obliquely oblong-obovate lateral sepals that seem to be exactly similar to the one shown in the photograph of *E. scabrum*. The petals when flattened out are cuneate-spatulate. The lamina of the lip has obliquely rounded lateral lobes and a larger subquadrate mid-lobe with a truncate apex which is slightly retuse and apiculate. In outline this latter organ might well be called cruciform.

The Peruvian *Epidendrum cardiophyllum*, which is represented in the Ames Herbarium by a photograph of the type, has scrabrous leaf-sheaths and ovate leaves up to 4 cm. long and 1.85 cm. wide, at intervals of about 2.5 cm. The paniculate inflorescence shows flowers with sepals similar to those of *E. loxense* and about 8 mm. long. The petals appear to be linear-spatulate. The lip is described as having orbicular lateral lobes and a subequally large mid-lobe which is broadly oblong and retuse-apiculate.

In one Peruvian collection (*Weberbauer 6828*) referable to *E. scabrum*, the leaves appear to vary from ovate-lanceolate to ovate in different plants, but the flowers are closely similar to those of *E. loxense*.

It therefore seems advisable to consider all of these concepts as representing a single variable species.

The habitat of *E. scabrum* was cited as "rocky mountains," that of *E. loxense* amid low thickets at 3000 to 3300 meters altitude, while *E. cardiophyllum* was said to grow in damp open woods mingled with shrubs at 2600 to 3000 meters altitude. A Peruvian collection (*Macbride 4887*) is cited as growing on a "wet rocky sphagnum slope," at about 2700 meters elevation.

The color of the flowers is given as sulphur yellow to clear yellow.

This species is found in Colombia, Ecuador (type of *E. loxense*) and Peru (type of *E. scabrum* and *E. cardiophyllum*).

Epidendrum Scutella *Lindley* in Bot. Reg. 30 (1844) Misc. p. 83; Fol. Orch. Epidendrum (1853) p. 49, no. 154.

Epidendrum platyoon Schlechter in Fedde Repert. Beih. 9 (1921) 91; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 120, nr. 473.

A photograph of the type specimens of the Ecuadorian *Epidendrum Scutella* from the Lindley Herbarium at Kew shows that it includes *Weberbauer 4101* which Kränzlin determined as *E. Scutella* but which Schlechter made the type of the Peruvian *E. platyoon*. The only notable discrepancies between the concepts are that the leaves of *E. Scutella* appear to be acute or subacute rather than obtusely bilobed, the inflorescences seem to be 3- or 4-flowered rather than commonly 1-flowered and the lip appears to be subobtuse to acute rather than strongly obtuse.

This species occurs in Venezuela, Colombia, Ecuador (type) and Peru (type of *E. platyoon*).

Epidendrum ventricosum *Lindley* in Hooker Journ. Bot. 3 (1841) 86; Fol. Orch. Epidendrum (1853) p. 44, no. 137.

Epidendrum pachygastrium Kränzlin in Fedde Repert. 1 (1905) 183.

After a careful comparison of these concepts which are both represented in the Ames Herbarium by records of the type collections, it appears that they are conspecific. Indeed the only discrepancies seem to be that in *E. ventricosum* (represented by a pen drawing with floral analysis) the leaves are narrower than those of *E. pachygastrium* (exemplified by a photograph of the type and by a fragment of the type collection) and the calli at the base of the lip in *E. ventricosum* are shown as subglobose, while those of *E. pachygastrium* are described as rather long.

Peru: No locality, *Mathews 1869* (type); Department of Amazonas, Valley of the Utcabamba River south of Chachapoyas, at 3000 meters altitude, on branches of sclerophyllous vegetation, consisting mainly of bushes interspersed with trees, *A. Weberbauer 4298* (as *E. pachygastrium*).

Bifrenaria *Lindley*

Lindleyella Schlechter

Lindleyella, a genus founded by Schlechter (Die Orchideen (1914) 414), is a segregate from *Bifrenaria* Lindl., based on *B. aurantiaca* Lindl. The reason for separating this generic concept from the variable genus *Bifrenaria* was claimed to be the presence of an elongate claw to the lip of this species, and the fact that the lateral lobes were abrupt and separated by a conspicuous callus.

It is a fact, however, that at least one species of true *Bifrenaria* (*B. sabulosa* Rodr.) has an equally elongate

lip-claw and lateral lobes nearly as abrupt as those in the concept *Lindleyella*. Furthermore, *Lindleyella aurantiaca* is the only species of that genus to conform with Schlechter's requirements. All of the other species so far referred to *Lindleyella* (*L. bicornaria* (Reichb.f.) Schltr., *L. floribunda* Schltr., *L. picta* Schltr. and *L. saxicola* Schltr.) have a short or very short claw to the lip, less abrupt lateral lobes and an additional callus near the claw. Finally, the concept *Lindleyella* shows the same short mentum exemplified by the type species of *Bifrenaria* (*B. atropurpurea* (Lodd.) Lindl.).

Therefore, since there is such a close vegetative similarity, as well as a general morphological agreement of the floral segments and even of pollinia, between these concepts and species of the genus *Bifrenaria*, I find it impossible to accept *Lindleyella* as a valid segregate.

In conformity with these views, the following transfers become necessary:

Lindleyella floribunda Schltr. (in Fedde Repert. Beih. 27 (1924) 84) = **Bifrenaria floribunda** (*Schltr.*) *C. Schweinfurth comb. nov.*

Lindleyella picta Schltr. (in Fedde Repert. Beih. 27 (1924) 173; ex Mansfeld in Fedde Repert. Beih. 58 (1930) t. 50, nr. 200) = **Bifrenaria picta** (*Schltr.*) *C. Schweinfurth comb. nov.*

Lindleyella saxicola Schltr. (in Fedde Repert. Beih. 27 (1924) 143) = **Bifrenaria saxicola** (*Schltr.*) *C. Schweinfurth comb. nov.*

In the Ames Herbarium (No. 26939), there is a specimen labelled *Lindleyella picta* Schltr. from near Buenaventura, Colombia, sent by C. W. Powell and determined by Dr. Schlechter. Since these data are cited under the type description, this collection may reasonably be considered to be an isotype. The flower is a close approxi-

mation to that of the type, as described and illustrated, except that the callus at the base of the lip is scarcely bilobulate as figured but appears to be a convex irregularly verrucose thickening. The lamina of the leaf is about 26 cm. long and 5.5 cm. wide, whereas the description postulates a leaf-blade 15 cm. long and almost 5 cm. wide.

A collection from Panama represents a closely similar but even larger plant than described for *Lindleyella picta*, being 45–60 cm. high according to the collectors' notes. The pseudobulb is only about 4 cm. high, instead of 5 cm. as specified. The lamina of the leaf is about 27 cm. long (nearly twice as long as the one typified) and is about 6.8 cm. wide; the petiole also is somewhat longer than described. The slightly larger flowers differ only in having a somewhat longer subquadrate lower portion of the lip and little narrower lateral lobes.

PANAMA: Province of Darien, Chepigana District, Cana-Cuasi Trail (Camp 1), at 800 feet altitude, March 18, 1940, *M.E. and R.A. Terry 1616* (Herb. Field Mus. No. 1034503).

Lindleyella saxicola was based on a Colombian specimen (Cundinamarca *A. Schultze 20*), but I have recently seen a collection from Peru (Loreto, *G. Klug 0.3*). The plants forming this latter collection, while showing some variability, have generally much larger vegetative dimensions than those attributed to the type, but the floral measurements are very similar. The roots are very stout (about 2–3 mm. thick), rather than "filiform"; the pseudobulbs are about 4 cm. high, as contrasted with 2–2.7 cm. high; the leaves, which are acute and not "acuminate," range from 18 to 30 cm. long, instead of "15–20 cm.," and reach a width of 6.6 cm., as contrasted with a maximum width of "6 cm."; the petiole is elongate, ranging from 8 to 18 cm. long, instead of "3–3.5 cm."; the inflorescence reaches about 55 cm. in length, con-

trasted with "up to 30 cm."; and the raceme is 19- to 22-flowered, instead of "8- to 12-flowered."

In another collection (Santander der Sur, Colombia, *Lawrance 850*) the vegetative portions are lacking, but the flowers are slightly smaller than typical, with narrower segments, rhombic-lanceolate petals and narrower lip with more cuneate claw.

Lycaste macrophylla *Lindley* in Bot. Reg. 29 (1843) Misc. p. 14—Ch. Morren in Ann. Soc. Bot. Gand. 4 (1848) 373, t. 221—Cogniaux in Martius Fl. Bras. 3, pt. 5 (1902) 457.

Maxillaria macrophylla Poeppig & Endlicher Nov. Gen. ac Sp. 1 (1836) 37, t. 64—Lindley in Bot. Reg. 24 (1838) Misc. p. 92.

Lycaste plana Lindley in Bot. Reg. 28 (1842) Misc. p. 85; in Bot. Reg. 29 (1843) t. 35.

Lycaste Filomenoi Schlechter in Fedde Repert. Beih. 9 (1921) 100; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 124, nr. 486.

Except for the concept *Lycaste Filomenoi*, reductions to synonymy have already been made.

Lycaste Filomenoi, which was described only from a flowering scape, appears to differ from the variable *L. macrophylla* only in having slightly smaller flowers with petals noticeably broader than the sepals. This character, while apparently not mentioned for *L. macrophylla*, is indicated in some of its illustrations and is seen in some specimens referred to *L. plana*.

This species has been recorded widely in northern South America—Venezuela, Colombia, Bolivia and especially Peru—and locally in Central America.

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AFRICAN ORCHIDS. XV

BY
V. S. SUMMERHAYES
(*Royal Botanic Gardens, Kew*)

THIS PAPER CONTAINS the descriptions of a number of new species of *Microcoelia* and *Angraecopsis*, two new combinations and some new records. The type specimens of the new species are all in the Kew Herbarium.

Nervilia petraea (*Afzelius ex Persoon*) *Summerhayes comb. nov.*

Arethusa petraea Afzelius ex Swartz in Kongl. Vetens. Acad. Handl. Stockh. 21 (1800) 230, *nomen tantum* —Afzelius ex Persoon Synops. Pl. 2 (1807) 512, descr.
Pogonia Thouarsii Rolfe in Dyer Fl. Trop. Afr. 7 (1897) 187, non Blume.
Nervilia Afzelii Schlechter in Engl. Bot. Jahrb. 45 (1911) 402—Summerhayes in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 420.

From Persoon's description it is evident that he was dealing with the same plant as that referred to *Pogonia Thouarsii* Bl. by Rolfe and later separated by Schlechter as *Nervilia Afzelii*. In each case the specimen collected by Afzelius in Sierra Leone is the only one cited. *N. petraea* is the only African species with hair-like outgrowths on the apical part of the lip, which is also somewhat lacerate in front. It has since been found in other parts of West Africa and in Uganda.

Bulbophyllum Josephi (*Kuntze*) *Summerhayes comb. nov.*

Bulbophyllum aurantiacum Hooker filius in Journ. Linn. Soc. Lond. Bot. 7 (1864) 219, non F. Mueller.

Phyllorchis Josephi Kuntze in Rev. Gen. Pl. (1891) 676.

Bulbophyllum Gustavi Schlechter in Fedde Repert. Spec. Nov. 9 (1911) 165.

Although the generic name *Bulbophyllum* Thouars is now conserved against *Phyllorchis* Thouars, this was not the case when Kuntze proposed the new epithet *Josephi* on transferring *B. aurantiacum* Hook.f. to *Phyllorchis*. The epithet is therefore quite legitimate and must be used for the species if it is retained in *Bulbophyllum*. Schlechter evidently overlooked this when he proposed the new epithet *Gustavi* many years later.

Microcoelia (§ **Eu-microcoelia**) **corallina** *Summerhayes sp. nov.*; affinis *M. Hirschbergii* Summerh. et *M. Perrieri* (Finet) Summerh.; ab illa florum colore, sepalis brevioribus latioribusque lateralibus valde obliquis, labello orbiculari nec elliptico, calcari apice magis inflato, viscidio elliptico; ab hac inflorescentiis multo brevioribus floribus densioribus, labello sessili lobis lateralibus nullis, sepalis uninerviis obtusis apiculatis distinguitur.

Herba pusilla, epiphytica, aphylla; caulis brevissimus, circiter 1 cm. longus, radices crassiusculas 2–3.5 mm. diametro flexuosas simplices vel pauciramosas glabras densissime emittens. *Inflorescentiae* erectae vel adscendentes, simpliciter racemosae, 1–2.5 cm. longae, fere ad basin dense multiflorae, basi cataphyllis imbricatis obtusis vel acutis instructae; bracteae circiter 1 mm. distantes, lanceolatae, acuminatae, 1–1.5 mm. longae. *Flores* patentes, albi, nitentes, corallino-roseo notati; pedicellus

cum ovario 4–6 mm. longus. *Sepalum* intermedium ovato-ellipticum, apiculatum, vix 2.5 mm. longum, 1.5 mm. latum; sepala lateralia valde obliqua, ovata, apiculata, plus 2.5 mm. longa, 1.7 mm. lata. *Petala* elliptico-oblonga, apice subtruncata, apiculata, basi subito angustata, marginibus sinuosis, sepalo dorsali aequilonga, 1.4 mm. lata; omnia tepala uninervia, saccis crystalliferis magnis instructa. *Labellum* sessile, orbiculare, apice retusum, basi columnam levissime amplectens, 2.8 mm. longum et latum, valde concavum; calcar dependens, dimidio inferiore cylindricum, superiore anguste ovoideo-inflatum, 5 mm. longum. *Columna* brevissima, crassissima, apice ± truncata, androclinio leviter excavato, reclinato; anthera duplo latior quam altior, rotundata; pollinia oblique ovoideo-pyriformia, fere 0.5 mm. longa, stipite uno subspathulato-ligulato leviter sigmoideo 0.4 mm. longo, viscidio transverse elliptico 0.2 mm. lato; rostellum breviter productum, obtusum.

Tanganyika Territory: Luengera Valley, N. of Korogwe, at Magoma, 450 m. alt., epiphytic on isolated tree in very little shade, Dec. 1942, Native Collector; comm. *W.M. & R.E. Moreau 448*. "Flower glistening white with coral-pink column, spur, central line on sepals and petals and spot at base of labellum; no scent."

This charming little species very closely resembles *M. Hirschbergii* Summerh. in general habit, especially the very dense tuft of smooth grey roots, and also in the general structure of the flower. In details, however, there are numerous differences, and the color of the flowers is very different, *M. Hirschbergii* having two brown spots at the base of the lip, the flowers being otherwise pure white. A striking feature of *M. corallina* is the presence of large crystal-containing sacs in the tepals especially near both sides of the central nerve.

Microcoelia (§ **Eu-microcoelia**) **ericosma** *Summerhayes sp. nov.*; affinis *M. Guyoniana* (Reichb.f.)

Summerh. a qua radicibus tenuioribus magis ramosis, floribus crebrioribus fragrantibus, tepalis latioribus obtusioribusque differt.

Herba epiphytica, aphylla; caulis brevis vel brevissimus, usque ad 4 cm. longus, 2–4 mm. diametro, apice cataphyllis scariosis lanceolatis acuminatis arcte imbricatis vestitus, radices numerosas flexuosas multo ramosas 1–2 mm. diametro glabras emittens. *Inflorescentiae* erectae vel suberectae, simpliciter racemosae, 4–9 cm. longae, densiusculc multiflorae; pedunculus 1–2.5 cm. longus, vaginis 4–5 obtusis instructus, ut rhachis pluriangulatus vel suleatus; bracteae 1–3 mm. distantes, lanceolatae, acutissimae vel acuminatae, circiter 1 mm. longae. *Flores* patentes vel erecto-patentes, albi, calcari apice carnoso, suaveolentes; pedicellus cum ovario 2–3 mm. longus. *Sepala* elliptica, rotundata vel brevissime apiculata, basi angustata, lateralia leviter obliqua, 2.4–3.4 mm. longa, 1.3–1.75 mm. lata, uninervia. *Petala* late elliptica, rotundata, basi angustata, 2.5–3.25 mm. longa, 1.3–1.85 mm. lata, uninervia. *Labellum* ellipticum vel oblongo-ellipticum, apice rotundatum vel leviter emarginatum, valde concavum, 2.4–3.3 mm. longum, 1.3–1.6 mm. latum, trinervium; calcar ex ore latiusculo incurvatim conicum, dimidio apicali cylindricum, obtusum, 2.5–3 mm. longum. *Columna* brevis, crassa, apice truncata, androclinio leviter excavato reclinato; anthera late subhemisphaerica, antice breviter producta, truncata; pollinia ovoideo-sphaerica, 0.4 mm. longa, stipite uno ligulato superne subspathulato-dilatato leviter sigmoideo 0.4–0.6 mm. longo, viscidio quadrato antice latiore truncato 0.3–0.4 mm. longo; rostellum breviter deorsum productum, latum.

Tanganyika Territory: Kilimanjaro, Marangu, epiphytic on large tree, Nov. 1941, *Forest Guard;* comm. *W. M. & R. E. Moreau 105.* "Flower white, tip of spur and pedicel pale pink, anther yellow; scent like heather"; same locality, Dec. 1932, *Geilinger 4207;* Amani,

Bomole, 907 m. alt., on tree at edge of rain forest, Dec. 1941, *Moreau 111* (Type). "Flower white including pedicel, only extreme tip of spur flesh pink, anther deep yellow; diurnal scent resembling Ling": Amani, 750 m. alt., epiphytic on *Parinari* sp., Dec. 1941, *Moreau 112*. "Flower white, pedicels and tip of spur yellowish flesh-coloured, scented."

A characteristic member of sect. *Eu-microcoelia* only to be distinguished from some other species by careful examination. The distinguishing features are the heather-scent, in allusion to which the specific epithet is given, the broad and obtuse constantly 1-nerved tepals which are devoid of colored or thickened median band and are almost devoid of crystal-containing sacs, and the rather slender much branched roots. It is evident that there are a number of species closely allied to *M. Guyoniana* (Reichb.f.) Summerh., differing in combinations of rather minute but, I think, quite significant characters. Whether these are true species or only local geographical races or varieties of one widely distributed species can only be decided when much more material is available.

Microcoelia (§ **Eu-microcoelia**) **obovata** *Summerhayes sp. nov.*; affinis *M. Guyonianae* (Reichb.f.) Summerh. a qua radicibus crassioribus dense papillosis, floribus duplo majoribus, labelli lamina quam calcari plus duplo longiore facile distinguenda.

Herba epiphytica, aphylla; caulis brevissimus circiter 1 cm. longus, apice cataphyllis numerosis scariosis acutis dense imbricatis coronatus, radices fere simplices crassas 2–4 mm. diametro dense papillosas emittens. *Inflorescentiae* erectae vel adscendentes, simpliciter racemosae, 5–9 cm. longae, fere ad basin laxiuscule 5–30-florae; rhachis teres vel leviter angulata; bracteae 3–5 mm. distantes, e basi vaginanti triangulari-ovatae, acutae, 1–2 mm. longae. *Flores* suberecti, albi, nitentes, calcaris apice et columna aurantiacis; pedicellus cum ovario circiter 4–5 mm. longus. *Sepalum* intermedium lanceolato-

oblongum, apiculatum, 5 mm. longum, fere 2 mm. latum; sepala lateralia praesertim prope basin obliqua, oblonga, apiculata, 5.5 mm. longa, fere 2 mm. lata; omnia sepala trinervia. *Petala* leviter oblique oblanceolato-oblonga, acuta, 5.25 mm. longa, 2–2.25 mm. lata; sepala et petala saccis crystalliferis distinctis instructa. *Labellum* late obovatum, apice rotundatum leviter retusum apiculo interjecto, 7.5–8 mm. longum, circiter 5.25 mm. latum: calcar conico-cylindricum e basi latiuscula sensim angustatum apice obtusum, leviter incurvatum, circiter 3.5 mm. longum. *Columna* crassa, brevis, 1 mm. alta, androclinio leviter excavato; anthera subhemisphaerica, antice breviter producta retuse truncata; pollinia reniformi-pyriformia, vix 0.5 mm. longa, stipite uno ligulato sigmoideo, viscidio anguste oblongo-elliptico 0.4 mm. longo; rostellum deorsum productum, deltoideum, viscidio amoto fere ad basin bipartitum, 0.5 mm. longum.

Tanganyika Territory: Luengera Valley, north of Korogwe, near Magoma, 450 m. alt., epiphytic on small tree in grassland, Dec. 1942, Native collector; comm. *W. M. & R. E. Moreau 445A*. "Flowers glistening white, column and tip of spur orange; no scent."

This interesting species agrees completely with section *Eu-microcoelia* in the column structure and relatively short spur but possesses an exceptionally large lip, thus making the flowers much larger than in the other species of the section. The roots are very stout and densely covered with erect hyaline papillae which give the surface a curious matt appearance. *M. Guyoniana* (Reichb.f.) Summerh. is probably the nearest relative but that species has more slender and smooth roots, and flowers about half the size.

Among a collection of spirit specimens of leafless Angraecoids received recently from Mr. W. J. Eggeling of the Uganda Forestry Service, are several new records for that country.

Microcoelia caespitosa (*Rolfe*) *Summerhayes* in Hutchinson & Dalziel Fl. West Trop. Afr. 2 (1936) 454, et in Bot. Mus. Leafl. Harv. Univ. 11 (1943) 151.

Uganda: Bunyoro, Budongo Forest, fl. Sept. 1943, *Eggeling 5238*.

This species has previously not been found farther east than Eala in the Belgian Congo, but it is evidently spread throughout the Equatorial rain-forest region.

Microcoelia microglossa *Summerhayes* in Hutchinson & Dalziel Fl. West. Trop. Afr. 2 (1936) 454, et in Bot. Mus. Leafl. Harv. Univ. 11 (1943) 147.

Uganda: Bunyoro, Budongo Forest, fl. Oct. 1943, *Eggeling 5450*.

As this species was known only from Southern Nigeria the above gathering records an extensive increase in its known geographical range. It is probable that it also occurs in the Belgian Congo.

Encheiridion macrorrhynchium (*Schlechter*) *Summerhayes* in Bot. Mus. Leafl. Harv. Univ. 11 (1943) 162.

Uganda: Bunyoro, Budongo Forest, fl. March 1943, *Eggeling 5213*.

This again represents a considerable extension of the range of the species, the most easterly location known previously being in the Gabon.

The excellent state of preservation of the material enables me to correct some of my opinions and statements in the reference cited above. In the Eggeling material the true side-lobes of the lip are clearly developed on the outside of the triangular calli, although these are adnate to them. The side-lobes are transversely rectangular-elliptical, very broad (approximately 2 mm. broad between the base of the column and the claw of the middle lobe), very short, and rounded-truncate.

The stipes of the pollinarium can be seen to be articu-

late with the narrow ligulate viscidium; in the upper part it is very fleshy and rounded-triangular in section, the widest flattened surface resting on the rostellum and androclinium. The two pollinia are attached by threads to the centre of the more or less truncated apex.

Angraecopsis breviloba *Summerhayes sp. nov.*; ab *A. parviflora* (Thou.) Schltr. foliis minoribus, inflorescentiis brevioribus dense multifloris, petalis liberis triangulari-lanceolatis, labelli lobis lateralibus ad dentes redactis, calcari satis breviore valde inflato distinguenda.

Herba epiphytica nana: caulis brevissimus, circiter 1 cm. longus, radices numerosissimas flexuosas simplices applanatas circiter 1.5–3 mm. latas dense emittens. *Folia* pauca, cito decidua, ligulata, usque ad 3 cm. longa et 5 mm. lata, apice obtusa brevissime bilobulata, obscure viridia. *Inflorescentiae* patentes vel adscendentes, usque ad 7 cm. longae, dense multiflorae; pedunculus 1–2 cm. longus, vaginis paucis instructus; rhachis flexuosa, angulata; bracteae 2–4 mm. distantes, arete vaginantes, obtusae vel acutae, 1–2.5 mm. longae. *Flores* secundi, patentes vel adscendentes, pallide virides; pedicellus cum ovario circiter 4 mm. longus. *Sepalum* intermedium ± recurvatum, oblongo-lanceolatum, subacutum vel obtusum, 3–4.5 mm. longum, 1–1.5 mm. latum; sepala lateralia et parallela porrecta, e basi angustata oblique curvatim lanceolata, acuta, 4–5.5 mm. longa, 1–1.5 mm. lata. *Petala* libera, oblique triangulari-lanceolata, acuta, 2.75–4 mm. longa, prope basin 1–1.5 mm. lata; omnia tepala trinervia. *Labellum* leviter incurvatum, dimidio inferiore breviter trilobatum, totum 3.75–4.5 mm. longum; lobus intermedius carnoso-subulatus, 2.5–3 mm. longus; lobi laterales dentiformes, subacuti, carnosi; calcar dependens vel leviter incurvatum, e basi angusta valde inflatum, 4.25–4.75 mm. longum, circiter 1 mm. diametro. *Col-*

umma subteres, truncata, 0.65–1 mm. longa, androclinio leviter excavato; anthera hemisphaerica, antice truncata; pollinia ovoideo-globosa, 0.5 mm. longa, stipitibus duobus genuflexis apice conniventibus, viscidio communi oblongo postice leviter retuso subtus concavo 0.6 mm. longo; rostellum leviter productum, porrectum, viscidio amoto bilobum, lobis obtusis. *Capsulae* ellipsoideae vel anguste pyriformi-ellipsoideae, 7–9 mm. longae, 2.5–4 mm. diametro, cum pedicello 2 mm. longo.

Kenya Colony: Ngong, near Nairobi, on forest trees, May 1934, *C. van Someren*, Coryndon Mus. No. 3653; Tana River basin, steppes of the Thika-thika, July 1893, *Gregory*.

Tanganyika Territory: Mondul, W. of Arusha, 1800 m. alt., on bole of tree 30 ft. from ground, May 1942, *Moreau 304* (Type); Mbulu, on bole of forest tree 12 ft. from ground, June 1942, *Moreau 304 A;* Kilimanjaro, Marangu, 1350 m. alt., on tree in river rain forest, in fruit, Nov. 1941, *Moreau 107*.

This species and the allied *A. tenuicalcar* Summerh. and *A. amaniensis* Summerh. are characterised by the nature of the pollinarium in which there is a single oblong viscidium to which the pollinia are attached by short stipites which arise close to one another, are then bent outward rather like knees, and converge again to approach one another at their apices where the pollinia are attached. So far, only *A. parviflora* (Thou.) Schltr.) has been recorded as possessing a common viscidium to the two stipites, but in this species the pollinarium is otherwise very different. *A. parviflora*, however, has the petals broadly triangular with the anticous margin united to the dorsal sepals and a trilobed lip with quite long lateral lobes.

A. breviloba, although lacking some of the more characteristic *Angraecopsis* characters, e.g. the petals as described above, seems correctly referred to the genus on account of the general habit and small leaves, the curious subspathulate-lanceolate lateral sepals held forward in a parallel manner on each side of the lip, the trilobed lip

and the column and rostellum structure. The petals are similar to those of *A. tridens* (Lindl.) Schltr. but the anticous margins are not quite so dilated as in that species. In none of the species so far described is the spur so swollen as in *A. breviloba*.

Angraecopsis tenuicalcar *Summerhayes sp. nov.*; ab *A. breviloba* Summerh. floribus paulo majoribus, pedicellis fere duplo longioribus, calcari cylindrico tenuissimo, pollinii stipitibus minus genuflexis; ab *A. ischnopo* (Schltr.) Schltr. petalis liberis anguste triangularibus, labelli lobis lateralibus brevissimis rotundatis, pollinii viscidio uno communi distinguitur.

Planta epiphytica, nana; caulis brevissimus, fere 1 cm. longus, radices numerosas flexuosas simplices applanatas 2–3 mm. latas emittens. *Folia* 2–3, cito decidua, ligulata, acuta, circiter 2.5 cm. longa et 3 mm. lata, subcarnosa, obscure viridia. *Inflorescentiae* dependentes vel patentes, tenues, 4–8 cm. longae, sublaxe multiflorae; pedunculus brevis, vaginis paucis instructus; rhachis teres, gracilis; bracteae 4–6 mm. distantes, vaginantes, obovatae, obtusae, circiter 2 mm. longae. *Flores* secundi, suberecti vel adscendentes, cremei, fragrantes; pedicellus cum ovario 7–8 mm. longus, filiformis. *Sepalum* intermedium anguste lanceolato-ellipticum, acutum, circiter 4 mm. longum, 1 mm. latum; sepala lateralia parallela et porrecta, ex ungue angusto curvatim lanceolata (vel anguste subspathulato-lanceolata), acuta, 6.75 mm. longa, 1 mm. lata. *Petala* libera, anguste lanceolato-triangularia, obtuse acuta, margine antica rotundato-dilatata, 4.5 mm. longa, basi 1.5 mm. lata; omnia tepala trinervia. *Labellum* leviter incurvatum, infra medium trilobatum, totum 5.5 mm. longum, inter lobos laterales fere 2 mm. latum; lobus intermedius lineari-subulatus, 3 mm. longus; lobi laterales brevissimi, triangulari-rotundati; cal-

car incurvatim dependens, cylindricum, tenuissimum, haud dilatatum, 10–12 mm. longum. *Columna* semiteres, circiter 1 mm. longa, androclinio leviter excavato; anthera fere hemisphaerica, antice haud producta; pollinia ovoidea, 0.35 mm. longa, stipitibus duobus leviter genuflexis teretibus polliniis aequilongis, viscidio uno communi oblongo postice leviter retuso 0.6 mm. longo convexo; rostellum breviter productum, lobis obtusis.

Tanganyika Territory: West Usambaras, Shumie, on bole of tree at forest edge, March 1942, *Moreau 325* (Type).

Very similar in general appearance and basic floral structure to *A. breviloba* Summerh. especially the pollinarium, but easily recognised by the relatively long slender tapering spur and other minor points mentioned in the diagnosis. *A. tenuicalcar* strongly resembles *A. ischnopus* (Schltr.) Schltr. from the Cameroons, but that species has broadly triangular petals adnate to the lateral sepals, a strongly trilobed lip with long lateral lobes and two separate viscidia to the pollinia.

Angraecopsis amaniensis *Summerhayes sp. nov.*; affinis *A. tenuicalcar* Summerh. a qua floribus viridibus, sepalis praesertim lateralibus brevioribus, inter se aequalibus superne incrassatis, calcari crassiore, columna breviore satis distinguenda.

Planta epiphytica, nana; caulis brevissimus, circiter 0.5 cm. longus, radices numerosas flexuosas simplices applanatas+30 cm. longas, 2–4 mm. latas, griseo-virides emittens. *Folia* 1–2, cito decidua, usque ad 1.5 cm. longa, obscure viridia. *Inflorescentiae* dependentes vel patentes, 1.5–4 cm. longae, subdense pluri- ad multiflorae; pedunculus brevis, usque ad 1 cm. longus, vaginis paucis instructus; rhachis leviter fractiflexa, gracilis; bracteae 1.5–3 mm. distantes, vaginantes, triangulari-ovatae, leviter acuminatae, circiter 2 mm. longae. *Flores*

secundi, erecto-patentes, pallide virides; pedicellus cum ovario 6–7 mm. longus, gracilis. *Sepalum* intermedium e basi pseudo-unguiculata late lanceolatum, acutum, 4 mm. longum, 1.75 mm. latum; sepala lateralia dorsali similia sed obliqua, 4.5 mm. longa, 1.6 mm. lata. *Petala* basi sepalis lateralibus per 0.5 mm. adnata, oblique lanceolata, margine antica supra basin leviter dilatata, 3.75 mm. longa, 1.6 mm. lata. Omnia *tepala* superne ineras-sata, saccis crystalliferis instructa. *Labellum* leviter recurvatum, medio vel infra medium trilobatum, totum 4 mm. longum, inter lobos laterales circiter 2 mm. latum; lobus intermedius linearis, carnosus, 2.25 mm. longus; lobi laterales brevissimi, rotundati; calcar incurvatim dependens, cylindricum, gracile, haud dilatatum, 10 mm. longum. *Columna* brevis, circiter 0.6 mm. longa, apice truncata, androclinio leviter excavato; anthera hemisphaerica, antice haud producta; pollinia fere globosa, 0.6 mm. diametro, stipitibus duobus genuflexis teretibus polliniis satis brevioribus, viscidio uno communi fere oblongo antice leviter angustato postice leviter retuso 0.7 mm. longo convexo; rostellum breviter productum, lobis obtusis.

Tanganyika Territory: East Usambaras, Amani, 900 m. alt., on exotic coniferous trees, July 1941, *Moreau 68* (Type).

This species strongly resembles *A. tenuicalcar* Summerh. in general appearance and in floral structure, and has the same type of pollinarium. However, the inflorescences are shorter, the flowers pale green and unscented while the sepals are approximately equal in length, instead of the laterals being much longer than the dorsal as in *A. tenuicalcar*. The spur, though of about the same length, is distinctly thicker. A striking feature is the thickened distal portions of the tepals which are furnished with numerous crystal sacs appearing as even denser points in the tissue.

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SOME PERUVIAN MAXILLARIAS

BY
CHARLES SCHWEINFURTH

DURING THE PROCESS of working up the genus Maxillaria for the orchid flora of Peru, it has seemed advisable to record the following taxonomic and nomenclatorial notes, amplifications and corrections of previous descriptions. Also, in accordance with our present practice of regarding the genus Ornithidium as referable to Maxillaria, it has been necessary to make several new combinations. Furthermore, there are included the descriptions of six Maxillarias which appear to be new.

Maxillaria alticola *C. Schweinfurth nom. nov.*
Ornithidium serrulatum Lindley in Bentham Pl. Hartw. (1845) 153, non *Maxillaria serrulata* Ames & Correll, 1943.

In transferring the concept *Ornithidium serrulatum* to the genus Maxillaria, it should be noted that the epithet *serrulata* has been preoccupied and that therefore a new name must be used.

The original description of *Ornithidium serrulatum* is very brief and by itself is inadequate to furnish a definite conception of this species. Fortunately, there are in the Ames Herbarium an excellent photograph of the type specimen bearing an analytical drawing of the flower made by Lindley and also several recent Peruvian specimens. Therefore, in order to clarify the species, a few supplementary notes are given herewith.

Plant stout but small for its alliance. Stem stout, about 47 cm. or less in height, loosely forking with erect-ascending branches, entirely concealed by distichous imbricating sheaths or leaf-sheaths. Leaves elliptic-oblong to narrowly oblong (rarely ovate-oblong), acute or subacute, amplexicaul at the slightly narrowed base, up to 12 cm. long and 2.2 cm. wide (usually smaller), with the upper margins minutely serrulate. Flowers small, axillary, cupuliform, deep yellow. Sepals connate near the base. Dorsal sepal ovate, acute, concave, about 9 mm. long and 5.8 mm. wide. Lateral sepals oblong-ovate, very slightly oblique, a little longer and narrower than the dorsal sepal. Petals oblanceolate-oblong to cuneate-elliptic, abruptly acute or apiculate, about 7.3 mm. long and 3 mm. wide above. Lip sigmoid when viewed from the side, fleshy, distinctly shorter than the sepals; lower portion broadly cuneate, concave; median portion consisting of a pair of erect semiorbicular lobes separated by a fleshy more or less sulcate callus; anterior portion subquadrate-ovate, apparently retuse, with a short but prominent conical boss beneath. Column small, incurved and dilated above, produced into a short foot. Ovary slender, triquetrous, developing into a triquetrous-ellipsoid fruit.

Ecuador: in the Cordillera near Loxa, *Hartweg 838* (Type); Loja, fide Schlechter in Fedde Repert. Beih. 8 (1921) 151.

Venezuela: Merida, fide Schlechter in Fedde Repert. Beih. 6 (1919) 90.

Peru: Huánuco, between Huánuco and Pampayaco (Pampayacu), January 13, 1927, *Ryozo Kanehira 317a, 332;* Playapampa, at about 2700 meters altitude, "wet rocky montaña edge," June 16–24, 1923, *J. Francis Macbride 4886;* same locality, altitude and date as the last, "sphagnum bank," *Macbride 4896.*

Maxillaria arbuscula *Reichenbach filius* in Bonpl. 4 (1856) 213.

Fernandezia punctata Ruiz & Pavon Syst. Veg. (1798) 239.

The examination of typical material of *Fernandezia*

punctata from the Madrid Herbarium shows that it represents a true Maxillaria of the caulescent many-leaved type entirely destitute of pseudobulbs and that it should be transferred to the latter genus. However, the epithet *punctata* is preoccupied by *Maxillaria punctata* Lodd. and another name is thus necessitated.

Fortunately, *Fernandezia punctata* seems to be referable to *M. arbuscula*, which was noted by Reichenbach as "Fernandezia del Peru." The only differences are that in *Maxillaria arbuscula* the leaves were described as up to 7.6 cm. long and 9 mm. wide (those of *Fernandezia punctata* being up to 6.4 cm. long and 6 mm. wide) and the callus on the lip is noted as linear, depressed and retuse, whereas that of *Fernandezia punctata* is oblong and much more conspicuous above with a rounded apex.

Maxillaria aurea (*Poepp. & Endl.*) *L. O. Williams* var. **gigantea** (*Lindl.*) *C. Schweinfurth comb. nov.*

Ornithidium giganteum Lindley in Bentham Pl. Hartw. (1845) 153.

Ornithidium boliviannum Schlechter in Fedde Repert. 27 (1929) 78.

A series of recent collections in the Ames Herbarium from Colombia, Peru and Bolivia agree well with an excellent photograph from the Lindley Herbarium of the type of *Ornithidium giganteum* which bears a floral analysis and with the description.

A perusal of this evidence indicates that *O. giganteum* seems to be merely a variety of *O. aureum*, as typified by Poeppig and Endlicher in Nov. Gen. ac Sp. 1 (1836) 57, t. 96 and described by Cogniaux in Martius Fl. Bras. 3, pt. 6 (1904) 89. It differs only in having the lip obscurely 3-lobed with the lobules consistently more or less erose-denticulate. The apical portion seems to vary from being relatively small to being subequal to the lateral lobules.

Although the type of *Ornithidium giganteum* came from Ecuador (near Loxa), later collections show that this plant is rather frequent and variable throughout the northwestern portion of South America. A collection noted as epiphytic (not terrestrial as often specified) from the high altitude of 3000–3300 meters (*F. W. Pennell 14119*) has very stout stems of uncertain height with relatively short broad leaves, up to 19.8 cm. long and 3.4 cm. wide, which are commonly conduplicate throughout and are more or less distichously imbricating.

The plant described as *Ornithidium boliviannum* Schltr., of which I have examined isotype material, appears to represent the usual form of *O. giganteum*.

Maxillaria brachypetala *Schlechter* in Fedde Repert. Beih. 9 (1921) 102; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 125, nr. 489.

A recently examined collection referable to this species shows several discrepancies from the description and from the later analysis.

The leaves, which vary from oblong to elliptic-oblong, reach a maximum length of 28 cm. and a width of 4.5 cm., whereas those of the type are described as ligulate and about 15–18 cm. long and 3–4 cm. wide.

The petals are not ligulate as described, but distinctly narrowly spatulate as figured.

The base of the lip is not long-cuneate, as shown in the figure, but subrounded. Consequently the lateral lobes are semiovate rather than triangular as shown and described.

Cuzco: Prov. Convención, Hda. Amaibamba, at 2000 meters altitude, epiphyte, February 1943, *C. Vargas 3418*.

Maxillaria caespitosa *C. Schweinfurth nom. nov.*
Ornithidium dolichophyllum Schlechter in Fedde Repert. Beih. 9 (1921) 106; ex Mansfeld in Fedde Re-

pert. Beih. 57 (1929) t. 126, nr. 495, non *Maxillaria dolichophylla* Schltr. (1912).

In referring *Ornithidium dolichophyllum* to the genus Maxillaria, a new epithet is required owing to the previous appearance of the combination *Maxillaria dolichophylla*.

In examining a flower from the type number, certain discrepancies from the description and from the analysis appear. The sepals are not oblong-ligulate as described and figured, but elliptic-lanceolate; and the petals are not subobtuse, but acute.

Maxillaria calantha *Schlechter* in Fedde Repert. Beih. 9 (1921) 102; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 125, nr. 490.

In comparing isotype specimens of *Maxillaria calantha* with the description and with the analytical figure of the flower, certain additions and corrections are found to be necessary.

The leaf, which is not mentioned in the description, consists of a petioled blade: the lamina is elliptic-oblong or narrowly elliptic, subacute to broadly obtuse, thickly coriaceous and up to 26 cm. long and 6.8 cm. wide; the petiole is more or less stout, channelled, up to 8.5 cm. long. The petals are linear-lanceolate and lack the constriction below the middle which is shown in the drawing. The lip has an ovate or triangular-ovate terminal lobe rather than a suborbicular lobe as shown in the drawing and the disc bears a triangular callus (neither described nor shown).

Maxillaria cornuta *C. Schweinfurth sp. nov.*

Herba parvula, probabiliter epiphytica. Rhizoma repens cum pseudobulbis subapproximatis. Pseudobulbi complanato-ovoidei, unifoliati. Folia oblanceolato-linearia vel oblanceolato-oblonga, apice irregulariter bilobato

rotundata, infra sensim angustata, nitentia. Scapi l
ales, breves, uniflori, vaginis ventricosis imbricatis
nino obtecti. Perianthii segmenta patentia. Sepa
dorsale oblongo-lanceolatum, acutum, dorso carinat
Sepala lateralia oblique oblongo-lanceolata, acuta, e
nata, basi dilatata et cum columnae pede mentum
gum formantia. Petala lanceolato-linearia, multo min
apice valde obtusa, super medium utrinque leviter
strieta. Labellum in positu naturali arcuato-recurvat
super medium trilobatum; lobi laterales erecti, semi
vati; lobus medius subquadratus, leviter retusus, pla
Columna in pedem longum producta.

Plant small but with comparatively large flowers
parently epiphytic. Rhizome creeping, slender, prov
with numerous stout fibrous glabrous roots. Pseudob
more or less crowded, complanate-ovoid, unifoliate, fi
rugose in the dried specimen, up to 1.2 cm. long,
tended by a few distichous fleshy sheaths. Leaves
able, oblanceolate-oblong or oblanceolate-linear, roun
at the apex with a somewhat unequally bilobed apicu
tip, gradually narrowed to a conduplicate scarcely
oled base, coriaceous, shining above, up to 11.6 cm. l
0.9–1.4 cm. wide, with the mid-nerve prominently
cate above and carinate beneath. Inflorescences 1-f
ered, short, lateral, basal, much shorter than the ma
leaves, entirely concealed by several distichous imbri
ing sheaths which are ventricose, apically truncate
apiculate and dorsally carinate. Flowers with sprea
segments. Sepals and petals fleshy-thickened ab
Dorsal sepal oblong-lanceolate, acute, apiculate, na
ular, dorsally carinate especially above, 1.8–1.9 cm.
and 6 mm. wide. Lateral sepals obliquely oblong-lan
late, acute, ecarinate, lightly decurved, 1.7–1.8 (ra
1.4) cm. long, triangular-dilated at the base and l
decurrent on the column-foot to form a mentum 0

cm. long. Petals linear-lanceolate, oblique, broadly obtuse and minutely apiculate, lightly constricted on each side near the thickened apex, 1.2–1.5 cm. long, about 3 mm. wide below the middle. Lip erect, parallel to the column, recurved and about equaling the lateral sepals in natural position, conspicuously 3-lobed above the middle, about 1 cm. wide when expanded, adnate to the column-foot near its apex; lateral lobes erect in natural position, semiobovate with a minute broadly rounded free portion which is irregularly dentate; mid-lobe subquadrate, lightly retuse at the subtruncate apex, flat, 7–8 mm. long, about 6 mm. wide; disc traversed through the lower half by an oblong-linear tricarinate callus. Column lightly arcuate, abruptly clavate above when viewed from the side, about 1 cm. long at the back, extended into a foot which is subequal to the column.

This species is apparently allied to *Maxillaria brevi-scapa* Poepp. & Endl., but has dissimilar petals and lip. It has much smaller flowers than *M. Koehleri* Schltr., with different petals and lip. It diverges from *M. Baumanniana* Schltr. in having smaller flowers, different petals, a long mentum and a dissimilar mid-lobe of the lip.

The specific name is in allusion to the spur-like mentum.

Junín: Chanchamayo Valley, "1924–1927," *Carlos Schunke s.n.* (Type in Herb. Field Mus. No. 571636); same locality, at 1800 meters altitude, October "1924–1927," *Schunke s.n.;* same locality, at 1800 meters altitude, October 1923, *Schunke 558.* (This collection differs from the usual form in having longer scapes and larger flowers which are very imperfect); Schunke Hacienda, above San Ramón, at 1300–1700 meters altitude, in dense forest, September 1925, *Schunke A70.*

Maxillaria crassicaulis *C. Schweinfurth nom. nov.* *Ornithidium Weberbauerianum* Kränzlin in Fedde Repert. 1 (1905) 91, non *Maxillaria Weberbaueri* Schltr. 1921.

In transferring *Ornithidium Weberbauerianum* to the genus Maxillaria, I find it advisable to choose a new epithet, as given above.

As compared with the type description, a photograph of authentic material in the Berlin Herbarium (*Weberbauer 6936*) distributed as the type, other specimens of this number and additional collections in the Ames Herbarium show certain discrepancies.

The leaves are described as ligulate or broadly linear, acuminate and bilobed at the apex, with a maximum width of 1.8 cm. However, in *Weberbauer 6936* and in the other collections referable to this concept, the leaves vary from oblong-lanceolate to oblong-ovate and are sharply acute (never acuminate nor bilobed), and some of the leaves attain a width of 2.6 cm.

Of even more importance, the type description cites the inflorescence as consisting of 3- to 4-flowered racemes —a character sharply at variance with the 1-flowered inflorescence of both Ornithidium and Maxillaria. However, our specimens have 1-flowered (commonly fascicled) inflorescences, in conformity with the requirements.

This species appears to be limited to the Departments of Junín and Cuzco in Peru.

Maxillaria cuzcoensis *C. Schweinfurth sp. nov.*

Herba variabilis. Pseudobulbi approximati, valde complanati, cylindracei, apice obliquo unifoliati. Folium petiolatum; lamina elliptico-oblonga vel anguste lanceolato-oblonga, acuta, basi cuneata, plusminusve coriacea; petiolus conduplicatus. Scapi numerosi, laterales, basales, uniflori, pedunculo vaginis separatis ventricosis ornato. Flos mediocris. Sepalum dorsale anguste lanceolato-oblongum, acutum, basi concavum, supra dorso carinatum. Sepala lateralia oblique triangulari-oblonga, sepalo dorsali similia, mentum conspicuum formantia. Petala

sepalis lateralibus similia sed minora. Labellum erectum, lateraliter visum leviter sigmoideum, supra medium leviter sed distincte trilobatum; pars basalis profunde concava, intus medio carina anguste oblonga tricarinata ornata; pars terminalis incrassata, ovata vel oblonga, subacuta. Columna brevis, leviter arcuata, in pedem paulo longiorem producta.

Plant variable, medium-sized to large. Rhizome apparently abbreviated, woody. Roots numerous, fibrous, slender, glabrous. Pseudobulbs approximate, strongly complanate, cylindric, unifoliate at the oblique apex, finely striate-rugose in the dried specimen, up to 6.4 cm. high, surrounded and in youth entirely concealed by several distichous imbricating sheaths of which the apical pair is often leaf-bearing. Leaf petioled; lamina elliptic-oblong to narrowly lanceolate-oblong, acute, cuneate below, more or less coriaceous, with the mid-nerve sulcate above and conspicuously carinate beneath, 10 to over 32 cm. long, 1.6–4.1 cm. wide; petiole conduplicate, about 1.7 cm. long. Scapes lateral, basal, numerous, 1-flowered, commonly much shorter than the leaves, suberect to lax; peduncle filiform, about 18.5 cm. or less long, mostly concealed by eight or less tubular ventricose sheaths of which the uppermost is up to 2.8 cm. long; pedicellate ovary slender, somewhat exceeded by a bract which is similar to the sheaths of the scape. Flower medium-sized, white, often with the lip pale rose to violet at the base. Dorsal sepal narrowly lanceolate-oblong, acute, concave at the base, with revolute margins, 2.5–2.7 cm. long, 6–8 mm. wide near the base when expanded, dorsally carinate above the middle. Lateral sepals obliquely oblong-lanceolate or triangular-oblong, acute or apiculate, dorsally carinate near the apex, forming with the column-foot a prominent mentum, 2.5–2.8 cm. long, 8–9 mm. wide at the base. Petals similar to

the lateral sepals but markedly smaller, obliquely oblong-lanceolate, acute, about 2.1 cm. long and 4.6 mm. wide near the base. Lip erect and parallel to the column in natural position, 1.3–1.4 cm. long, lightly sigmoid when viewed from the side, lightly but distinctly 3-lobed above the middle; lower portion deeply concave with erect sides, about 1 cm. long; terminal portion or mid-lobe much smaller, very fleshy, ovate to oblong, subacute when expanded, more or less sulcate above and carinate beneath, with revolute margins; disc in the middle with a short median oblong callus flanked by a pair of thickened lines, pubescent at the base. Column short and stout, lightly arcuate, somewhat clavate when viewed from the side, 6–6.5 mm. long at the back, with an erose-margined clinandrium which is 3-dentate at the apex, extended into a slightly longer foot.

This species seems to be allied to the Ecuadorian *Maxillaria hastulata* Lindl., but varies in having the petioles much shorter than the leaves and scapes, differently colored flowers and in an apparently dissimilar lip. It also has a very different lip from that of the Colombian *M. pulla* Linden & Reichb.f.

Cuzco: Habitat unrecorded, 1931, *C. Bues s. n.;* Prov. Quispicanchi, Chaupichaca, Marcapata Valley, at 1800–1900 meters altitude, "mixed formation of shrubwoods and grass steppe on stony places," February 19–20, 1929, *A. Weberbauer 7834* (Type in Herb. Field Mus. No. 605347; isotype in Herb. Ames No. 61907); Hda. Itío, Marcapata, at 2000 meters altitude, in open rocky places, January 27, 1943, *C. Vargas 3126;* Prov. Convención, Hda. Potrero, Sapan-Sachayocc, at 2200 meters altitude, epiphyte in deep forest, March 5, 1942, *Vargas 2527.*

Maxillaria disticha (*Lindl.*) *C.Schweinfurth comb. nov.*

Ornithidium distichum Lindley in Bentham Pl. Hartw. (1845) 153.

Since the description of *Ornithidium distichum* is too inadequate to afford a clear conception of the species, it

seems advisable to give a few additional notes based on a photograph of the type which is in the Lindley Herbarium at Kew.

Rhizome relatively slender, sparingly branched, bearing stems at intervals of 6 to 9 cm. Stems short, robust, simple, arcuate, wholly destitute of pseudobulbs, entirely concealed by distichous densely imbricating leaf-sheaths (the blades deciduous below), up to 9 cm. long. Leaves obtuse to subacute, sessile at the conduplicate base, spreading, up to 3.8 cm. long and 8 mm. wide. Flowers small, axillary. Dorsal sepal lanceolate or ovate-lanceolate, concave, about 6 mm. long and 3.8 mm. wide. Lateral sepals oblong-lanceolate or triangular-lanceolate, oblique, forming a short rounded mentum.

"Peru" (?), fide Schlechter in Fedde Repert. Beih. 9 (1921) 166.

Ecuador: near Loxa (Type).

Maxillaria elegantula *Rolfe* in Kew Bull. (1898) 196.

Maxillaria dichroma Rolfe in Kew Bull. (1898) 197.

Judging by the descriptions of these species supplemented by excellent photographic records in the Ames Herbarium of the types, these concepts appear to be inseparable.

Aside from the fact that *M. elegantula* has sometimes a slightly longer scape and floral segments than *M. dichroma*, the only discrepancy is a slight difference in the reported color of the flowers.

With the appearance of one certain and two probable collections of *Maxillaria elegantula* from Peru, it seems advisable to give a few supplementary remarks.

There appears to be a stout creeping rhizome (not mentioned in the description of either concept). The pseudobulb (also neither mentioned nor shown in the photographs of the types) is narrowly complanate-ellip-

soid and 5.7 cm. or less long, with sometimes an abruptly narrowed apical portion. Surrounding the pseudobulb is at least one pair of unequal distichous conduplicate sheaths of which one is leaf-bearing. The lamina of the leaf is elliptic-oblong, not oblong-lanceolate as described, and measures 29 cm. in length and 5 cm. in width, whereas those of the types appear to be 23.75 cm. or less long and 4 cm. or less wide. The lateral sepals and petals seem to be lanceolate or oblong-lanceolate when the revolute margins are expanded (not triangular-oblong as described). The lip appears to be oval in outline, rather than obovate-oblong as cited.

Cuzco: Prov. Convención, "alturas de Pintobamba," at 2400 meters altitude, in humus of open forest, flower white with dark blue lip, March 3, 4, 1943, *C. Vargas 3287*.

Maxillaria exaltata (*Kränzl.*) *C. Schweinfurth comb. nov.*

Camaridium exaltatum Kränzlin in Engler Bot. Jahrb. 37 (1906) 386.

After examining an excellent photograph of the type collection of *Camaridium exaltatum* in the Ames Herbarium, there are evident certain discrepancies from the type description. First in importance, I am unable to detect any suggestion of pseudobulbs which are described in the diagnosis (l. c.). Again the sepals appear to be oblong-lanceolate (not linear) with both dorsal and lateral sepals about 1.8 cm. long (the lateral sepals are described as 2.3 cm. long).

A recent collection from Sandia in the Province of Puno (*McCarroll 123*) has somewhat smaller flowers than typical, the sepals being 1.5–1.7 cm. long. Moreover, its lip differs in having a broadly ovate or ovate-triangular (not oblong) mid-lobe and in the disc bearing only a small oblong sulcate (not an elongate navicular) callus.

Maxillaria floribunda *Lindley* in Bentham Pl. Hartw. (1845) 154.

In accordance with a photograph of the type of this species from the Lindley Herbarium at Kew and with a recent collection (*Vargas 2650*) which seems to be surely referable to this concept, certain corrections and amplifications of the original description appear to be advisable.

Both the type and the collection show that the leaves are elliptic to oblong, rather than ovate-oblong as specified. *Vargas 2650* also shows a well-defined pseudobulb (that of the type specimen is obscure at best) which is complanate-ellipsoid, about 3.5 cm. long, unifoliate and surrounded by several distichous conduplicate leaf-bearing sheaths. The peduncle in this collection measures about 19.5 cm. or less long, whereas the description notes the scapes as "tripollicares," signifying 7.6 cm. The sepals and petals appear to be decurved with strongly revolute sides. The sepals, which are rather short-acuminate, are linear-oblong (dorsal) to linear-lanceolate (lateral) and about 6.4 cm. long and 8 mm. wide. The petals are linear-lanceolate and similar to the lateral sepals, but much smaller. The relatively small lip appears to be subquadrate-oval when expanded and about 1.4 cm. long; the lobing seems to be near the apex, the mid-lobe is transversely broad-oblong or reniform and retuse, unlike that of the pen-drawing on the type sheet which is elliptic-ovate. The column is about 7 mm. long, produced into a bisulcate foot.

Cuzco: Prov. of Urubamba, Tuncapata-Santa Rita, at 2800 meters altitude, epiphyte in forest, perianth white, March 28, 1942, *C. Vargas 2650.*

Maxillaria funicaulis *C. Schweinfurth sp. nov.*

Herba robusta, caulescens. Pseudobulbi rari, complanato-cylindracei, diphylli. Caules vaginis numerosis, distichis, conduplicatis, valde imbricatis omnino obtecti.

Folia oblonga vel ligulata, apice bilobulato rotundato-obtusa, sessilia vel breviter petiolata. Inflorescentiae breves, uniflorae, in caulinarum vaginarum axillis. Flores parvi, aurei. Sepalum dorsale ovato-oblongum, subacutum, concavum. Sepala lateralia oblonga vel ovato-oblonga, subacuta, paulo minora. Petala ovato-oblonga, obliqua, apice late rotundata. Labellum ovato-oblongum, apice rotundatum vel truncatum, basi rotundatum, super medium leviter angustatum cum lateribus erectis; discus medio conspicue callosus. Columma perbrevis, in pedem brevem extensa.

Plant large, growing on rocks. Stems elongate, bearing distant pseudobulbs, entirely concealed by a series of distichous sheaths which are densely imbricated, conduplicate, and become gradually larger upward and articulated to small immature leaf-blades. Pseudobulbs complanate-cylindric, somewhat clavate in the dried specimen, bifoliate, 4.5–6 cm. long, finely multistriate when dry, partially concealed on each side by one or more conduplicate sheaths the uppermost of which bear conduplicate blades. Leaves oblong to ligulate, the larger ones sessile to distinctly petioled; lamina obtuse to rounded and more or less unequally bilobed at the apex, somewhat narrowed below, subcoriaceous, 18–26 cm. long, up to 2.9 cm. wide, with the mid-nerve rather conspicuous beneath; petiole (if present) up to 4.5 cm. long, slender, channelled. Inflorescences numerous, short, erect, 1-flowered, in the axils of the cauline sheaths; peduncle about 2.5 cm. long, appressed, entirely covered by several scarious imbricating sheaths, wholly or mostly hidden by the stout imbricating conduplicate cauline sheaths; pedicellate ovary prominently exserted, slender-cylindric, plurisuleate in the dried specimen, about 3.5 cm. long, surrounded at the base by an appressed infundibuliform scarious sheath about 1.5 cm. long. Flow-

ers small for the genus, yellow, campanulate. Dorsal sepal ovate-oblong, concave, subacute, with incurved apical margins, about 14 mm. long and 6.4 mm. wide when expanded, many-nerved. Lateral sepals oblong or ovate-oblong, subacute, about 13.3 mm. long and 5.9 mm. wide, slightly oblique, many-nerved. Petals obliquely ovate-oblong, abruptly rounded with a minute conical dorsal thickening at the apex, about 10 mm. long and 5 mm. wide, minutely ciliolate, slightly recurved above. Lip erect, gently arcuate-recurved with the sides of the lower portion erect in natural position, very shortly clawed, simple, ovate-oblong, lightly narrowed on each side above the middle with incurved margins, rounded at the base, broadly rounded or subtruncate at the apex, about 8.7 mm. long and 4 mm. wide below when expanded; disc through the basal half with an obscure central thickening which terminates in a conspicuous rounded callus in the center of the lip. Column very short and stout, clavate, about 6 mm. high at the back, produced at right angles into a prominent foot which is markedly shorter than the column.

This species is allied to *Maxillaria spilotantha* Reichb. f. from Venezuela and Ecuador, but has much larger leaves, a quite different mode of flowering and somewhat smaller flowers. It appears to be very closely related to the Colombian *M. Schnitteri* Schltr., but has a much smaller dissimilar lip.

The specific name is in allusion to the rope-like appearance of the stem.

Cuzco: Prov. Quispicanchi, Marcapata, Itío to Murayaca, at 1960 meters altitude, January 28, 1943, *C. Vargas 3137* (Type in Herb. Vargas; isotype in Herb. Ames No. 62111).

Maxillaria graminifolia (*HBK.*) *Reichenbach filius* in Walpers Ann. 6 (1863) 538.

Isochilus graminifolius Humboldt, Bonpland & Kunth

Nov. Gen. et Sp. 1 (1816) 340, t. 78—Lindley in Bot. Reg. 27 (1841) sub t. 1 (as *graminifolium*).

Camaridium graminifolium Reichenbach filius in Linnaea 22 (1849) 857.

Maxillaria Mattherii Reichenbach filius in Walpers Ann. 6 (1863) 539, non Lindley 1845.

Although I have seen no material of typical *Maxillaria Mattherii* Reichb.f., there is in the Ames Herbarium a floral analysis of this concept from the Reichenbach Herbarium.

In addition, I have examined several Peruvian collections referable to *M. graminifolia* and these specimens approximate the description and floral drawing of *M. Mattherii* above cited, the lip of the former concept being extremely variable.

Until there is available a more detailed example of *M. Mattherii* Reichb.f., it seems advisable to relegate this concept to synonymy. This action is sustained by the fact that Lindley considered this species as originally forming a part of the concept recognized by him as *Isochilus graminifolium*.

Maxillaria heteroclita *Poeppig & Endlicher* Nov. Gen. ac Sp. 1 (1836) 37, t. 63—Cogniaux in Martius Fl. Bras. 3, pt. 6 (1904) 27.

The several drawings of the flower illustrating the original description of this concept appear to be a close match for the flower of *Zygopetalum* (§ Warscewiczella) *rhombilabium* C. Schweinf. which is described and illustrated in Am. Orch. Soc. Bull. 12 (1944) 422.

On the other hand, *Maxillaria heteroclita* is described and shown with a distinct unifoliate pseudobulb (such as is typical of one group of the variable genus Maxillaria), whereas *Zygopetalum rhombilabium* lacks any pseudobulb and has a fan-like cluster of several leaves. As before

mentioned, however, the flower of *M. heteroclita* is that of a true Zygopetalum.

Appended to the original description of *Maxillaria heteroclita* are these words (translated from the Latin): We are very sorry that we are unable to add further data to this rather imperfect description . . . . of a very remarkable and elegant species. For the specimens were among the most scanty of our herbarium and we found them badly eaten by insects. The figure was made near the living plant in its native place.

It is significant that *Maxillaria heteroclita* is the only orchid described in Nov. Gen. ac Sp. I which bears no mention of its habitat. Doubtless the concept came from Peru like the several other Maxillarias described in that work. It seems inconceivable, that two species from the same general region should have nearly identical floral segments and yet belong to quite different genera. The wise course, therefore, appears to be to consider *Maxillaria heteroclita* to be a concept of dubious validity.

Maxillaria huancabambae (*Kränzl.*) *C. Schweinfurth comb. nov.*

Ornithidium Huancabambae Kränzlin in Engler Bot. Jahrb. 54, Beibl. 117 (1916) 29.

In the examination of isotype material of this species (*Weberbauer 6098*), certain discrepancies from the description and additions to the diagnosis may be noted.

In the first place, the roots do not appear everywhere ("passim") but are concealed as parallel strands within the sheaths of the rhizome. Again the pseudobulbs appear to be about 2 cm. (not 1.5 cm.) distant. Careful inspection shows that they are closely invested by a thin membranaceous sheath which extends as an irregular narrow cup around the basal portion of the leaves. Rarely the pseudobulbs are 3-leaved at the apex. The leaves

are prevailingly elliptic or elliptic-oblong, rather than oblong-lanceolate as described. The sepals are oblong-ovate and about 7.9 mm. long, whereas the type description cites them as oblong-lanceolate or broadly oblong and 7 mm. long. The dorsal sepal is 4 mm. (not 1.5 mm.) wide and the lateral sepals are slightly over 4 mm. (not 3 mm.) wide. The petals are 2 mm. (not 1 mm.) wide. The lip is approximately elliptic-ovate (not obovate) and is 4 mm. wide when expanded (not 2.5 mm. in front).

Maxillaria huancabambae (*Kränzl.*) *C. Schweinf.* var. **cuzcoensis** *C. Schweinfurth var. nov.*

This variety differs from the species in the following particulars. Leaves relatively slender, linear-oblong to narrowly elliptic-oblong, up to 3.8 cm. long, 4–5 mm. wide; those of the type are elliptic to oblong-elliptic and up to 3.2 cm. long, 6–9 mm. wide. Flowers white; those of the type golden- to orange-yellow. Sepals somewhat narrower than in the type. Lateral lobes or auricles of the lip consisting of indistinct dilations; those of the type distinct and triangular-ovate. Column very short, about 1.5 mm. long at the back; that of the type much longer, about 2.7 mm. long at the back.

Cuzco: Prov. of Convención, Hda. Potrero, Sapan-Sachayocc, at 2200 meters altitude, epiphyte in dense forest, March 5, 1942, *C. Vargas 2253* (Type in Herb. Ames No. 61950).

Maxillaria infausta *Reichenbach filius* in Bonpl. 3 (1855) 216.

After an examination of a drawing of this concept including a rough sketch of the flower from the Reichenbach Herbarium at Vienna and especially of an actual specimen of what doubtless is an isotype bearing the notation "Peruvia Matthews 1862," it seems advisable to publish a few clarifying remarks.

Plant medium-sized, caulescent. Stem entirely con-

cealed by imbricating loose distichous leaf-bearing sheaths, sometimes once forking near the base with subparallel branches. Leaves numerous, distichous, spreading-ascending, oblong or elliptic-oblong, often up to 3.7 cm. long and 7 mm. wide, sessile. Inflorescences solitary in the upper (but not uppermost) axils, strict, with very short peduncles and long-exserted pedicellate ovaries. Flowers small. Dorsal sepal ovate-oblong, abruptly acute or apiculate at the rounded apex, about 9.2 mm. long and 4.2 mm. wide. Lateral sepals similar, oblique, complicate-acute and apiculate, very slightly shorter and narrower than the dorsal sepal. Petals broadly oblong or obovate-oblong (rather than "ovate"), obtuse, shorter than the sepals but equally wide. Lip obovate-oblong in outline, constricted on each side (i.e. lobulate), rounded-truncate and lightly retuse in front, rounded-cuneate below, about 7 mm. long and 4.4 mm. wide near the middle; callus on the disc sometimes obscure. Column about 2.8 mm. long at the back, with a very short foot.

Maxillaria longibracteata (*Lindl.*) *Reichb.f.* var. **grandiflora** (*Lindl.*) *C. Schweinfurth var. nov.*

Isochilus grandiflorus Lindley in Bot. Reg. 27 (1841) sub t. 1 (as *grandiflorum*).

Camaridium grandiflorum Schlechter in Fedde Repert. Beih. 9 (1921) 165.

H. G. Reichenbach states (in Walpers Ann. 6 (1863) 540) that he had carefully inspected the type of *Isochilus grandiflorus*, and, as a result, he referred this concept to the synonymy of *Maxillaria luteorubra* Reichb.f. (*Camaridium luteo-rubrum* Lindl.).

Judging by the original description and a pen drawing of the flower of *Isochilus grandiflorus* from the Lindley Herbarium, I cannot subscribe to this treatment. *Isochilus grandiflorus* differs from *Camaridium luteo-rubrum*,

of which there is in the Ames Herbarium a record of the type bearing a pen drawing of the lip, in two rather striking particulars. On the flower of the former species, the upper bract is indicated as extending up to one half the length of the dorsal sepal and the petals are noted as about half as long as the sepals. In *Maxillaria luteorubra*, on the other hand, the upper bract is much shorter than the pedicellate ovary and the petals are not much shorter than the sepals.

The disc of the lip of *Isochilus grandiflorus* is described as naked, but the fact that Reichenbach treated this concept as a synonym of *Maxillaria luteorubra* (which is clearly marked with a basal callus on the lip), shows either that Lindley failed to observe this feature or that the callus had become detached as sometimes occurs in specimens of this group.

It seems to me preferable that the concept represented by *Isochilus grandiflorus* should be treated as a variety of *Maxillaria longibracteata*, a species which it closely resembles, differing chiefly in having distinctly narrower leaves.

Maxillaria longibracteata (*Lindl.*) *Reichb.f.* var. **luteorubra** (*Lindl.*) *C. Schweinfurth var. nov.*

Camaridium luteo-rubrum Lindley Orch. Linden. (1846) 22, no. 114.

Maxillaria cassapensis Reichenbach filius in Walpers Ann. 6 (1863) 539—Cogniaux in Martius Fl. Bras. 3, pt. 6 (1904) 76.

Maxillaria luteorubra Reichenbach filius in Walpers Ann. 6 (1863) 539.

Camaridium cassapense Schlechter in Fedde Repert. Beih. 9 (1921) 165.

Records of typical *Camaridium luteo-rubrum* in the Ames Herbarium show that this concept differs from

Maxillaria longibracteata (*Camaridium longibracteatum* Lindl.) chiefly in having markedly narrower leaves which vary from narrowly oblong-lanceolate to linear-oblong. The uppermost bract on the peduncle also is much shorter than the pedicellate ovary and not subequally long as in *M. longibracteata.*

In the Ames Herbarium there is an Ecuadorian collection (*Penland & Summers 243*) which differs from typical *C. luteo-rubrum* in having narrow linear-lanceolate leaves and rather smaller flowers than usual in that concept, but the general contour of the floral segments is closely similar and the lip is an exact counterpart of that drawn on the type sheet of *C. luteo-rubrum.*

The concept described as *Maxillaria cassapensis*, which is represented in the Ames Herbarium by drawings of the habit and floral analyses from the Reichenbach Herbarium, is also a narrow-leaved plant with loosely branching stems, and, according to the description, with bracts subequaling the pedicellate ovary. Whether the stems are simple as in *Camaridium luteo-rubrum* or branched as in *Maxillaria cassapensis* is a highly variable character and consequently unimportant. In the drawing of the type, also, the upper bract is shown as much shorter than the pedicellate ovary, as in *Camaridium luteo-rubrum*, and not subequaling it as described. Finally, the floral analysis of *Maxillaria cassapensis* shows no discernible discrepancy from the flower of *C. luteo-rubrum.* It appears to be desirable, therefore, to treat the concepts typified by *Camaridium luteo-rubrum* and *Maxillaria cassapensis* as variants of the polymorphic species, *M. longibracteata.*

Maxillaria multicaulis (*Poepp. & Endl.*) *C. Schweinfurth comb. nov.*

Siagonanthus multicaulis Poeppig & Endlicher Nov. Gen. ac Sp. 1 (1836) 40, t. 69.

Ornithidium multicaule Reichenbach filius in Bonpl. 2 (1854) 18; in Walp. Ann. 6 (1863) 490.

Maxillaria nubigena (*Reichb.f.*) *C. Schweinfurth comb. nov.*

Ornithidium nubigenum Reichenbach filius in Walpers Ann. 6 (1863) 488; in Linnaea 41 (1876) 35.

The original and only prior collection of this species came from Pamplona, Colombia, about 1200 or more miles from the Peruvian collections cited below and at the much greater altitude of about 3000 meters.

Inasmuch as both of the descriptions of this concept are rather inadequate and give no reference to size, the following specific notes are now added.

Plant large, sprawling, loosely branched, the stout stem being mostly concealed by tubular rugulose sheaths of which the upper ones are more or less separated and leaf-bearing. At intervals of 11 to 20 cm., (often in the angle formed by the branches) are short stout strobiliform stems, up to 6 cm. long, concealed by several pairs of closely imbricating distichous scarious-margined leaf-sheaths. Leaves linear, long-acuminate, slightly narrowed toward the base, more or less falcate, rigid, coriaceous, appearing more or less convolute in the dried specimen, up to 30 cm. long and 1.1 cm. wide. Inflorescences numerous, abbreviated, 1-flowered, in the axils of the leaf-sheaths on the short strobiliform branches. Flowers small, deep pink to dark red, campanulate, with fleshy segments. Dorsal sepal oblong-ovate, acute, concave, about 7.5 mm. or less long, 3–3.7 mm. wide. Lateral sepals obliquely oblong-ovate, slightly smaller than the dorsal sepal. Petals oblong-elliptic, much smaller than the sepals. Lip much shorter than the sepals in natural position, sigmoid when viewed from the side, simple or nearly so, from a cuneate concave base gradu-

ally dilated in the middle forming a pair of upcurved semiorbicular lobules, then slightly contracted into an oblong-subquadrate sulcate anterior portion which is retuse at the apex; disc fleshy-thickened in the middle and near the apex. Column short, stout, prominently angled in front.

Ayacucho: Aina, between Huanta and Río Apurimac, at 750-1000 meters altitude, epiphyte in open woods, May 7, 17, 1929, *E.P.Killip & A.C.Smith 22612*—Junín: Chanchamayo Valley, at 1800 meters altitude, September 1929, *Carlos Schunke 1844;* same data, August 1930, *Schunke 1845*.

Maxillaria parvibulbosa *C. Schweinfurth sp. nov.*

Herba terrestris, major. Pseudobulbi perparvi, saepissime aggregati, in sicco cylindracei, unifoliati. Folium conspicue petiolatum; lamina anguste oblonga vel elliptico-oblonga, acuta, basi cuneata; petiolus elongatus, gracilis, profunde sulcatus. Scapi laterales, basales, breves, tenues, uniflori, pedunculo vaginis laxis obtecto. Flos grandis. Sepalum dorsale lineari-lanceolatum, longe acuminatum, tubulari-involutum. Sepala lateralia anguste et oblique triangulari-lanceolata, acuminata, cum columnae pede mentum conspicuum formantia. Petala sepalis lateralibus similia sed minora. Labellum segmentis ceteris multo brevius, parte inferiore erecta, prope apicem profunde trilobatum; lobi laterales angustissimi, apice libero brevi rotundato; lobus medius elliptico-lanceolatus, crassus, marginibus valde undulatis. Columna brevis, a latere visa crassa, in pedem longum extensa.

Plant terrestrial, rather large. Roots fibrous, filiform, glabrous. Rhizome apparently short, creeping. Pseudobulbs commonly approximate, very small, obliquely cylindric or ellipsoid-cylindric and finely striate-rugose when dry, somewhat compressed, unifoliate, about 2 cm. or less long, more or less concealed and much surpassed by several distichous sheaths which waste into fibres.

Leaf conspicuously petioled; lamina linear-oblong or elliptic-oblong to narrowly oblong-lanceolate, acute, cuneate below, 14–21.4 cm. long, up to 2.9 cm. wide, subcoriaceous, with the mid-nerve sulcate above and conspicuously carinate beneath; petiole long, slender, channelled, 4–11 cm. long. Scapes lateral, basal, several, short, slender, lax to erect-ascending, 1-flowered, the pedunele with the pedicellate ovary up to 14 cm. long; peduncle mostly or entirely concealed by several loose tubular sheaths which are smaller and imbricated below; pedicellate ovary slender, concealed and slightly exceeded by a bract similar to the sheaths of the peduncle. Flower large, white and lilac-rose, with only slightly spreading segments. Dorsal sepal linear-lanceolate, long-acuminate, tubular-involute, up to 3.4 cm. long and 7.6 mm. wide across the concave basal part when expanded. Lateral sepals narrowly triangular-lanceolate, oblique and gently upcurved above, acuminate, adnate to the column-foot to form a prominent triangular mentum, up to 3.5 cm. long and 1 cm. wide at the base. Petals very similar to the lateral sepals, gently upcurved with a long-acuminate apex, about 2.9 cm. long and 4.5 mm. wide below. Lip much shorter than the sepals and petals, erect, parallel to the column, lightly recurved and up to 1.95 cm. long in natural position with the sides of the lower portion erect, deeply 3-lobed near the apex, sessile, elliptic-oblong in outline, about 6 mm. broad when expanded; lateral lobes long and narrow with a short ovate-rounded free apex; mid-lobe elliptic-lanceolate, obtuse, very fleshy through the middle, sulcate above and carinate beneath, with strongly undulate margins, about 6 mm. long; disc with an oblong-lanceolate sulcate callus in the middle, lightly pubescent and ecallose in the center near the base. Column short, stout, abruptly clavate and lightly arcuate when viewed from the side,

nearly 8 mm. long at the back, produced into a somewhat longer narrow sulcate foot.

This species seems to be nearly allied to the Colombian *Maxillaria arachnites* Reichb.f. which has differently colored flowers with a much shorter broader lip. The lobing and proportions of the lip distinguish this species from *M. anatomorum* Reichb.f. The Colombian *M. vestita* Schltr. appears to lack distinct elongate petioles and to have a smaller dissimilar lip.

San Martín: Zepelacio, near Moyobamba, at about 1100 meters altitude, terrestrial in mountain forest, May 1934, *G. Klug 3618* (Type in Herb. Ames No. 61909; isotypes in Herb. Gray No. 70, in Herb. Field Mus. No. 753175 and in U.S. Nat. Herb. No. 157671).

Maxillaria pendula (*Poepp. & Endl.*) *C. Schweinfurth comb. nov.*

Scaphyglottis pendula Poeppig & Endlicher Nov. Gen. ac Sp. 1 (1836) 58, t. 98.

Ornithidium pendulum Cogniaux in Martius Fl. Bras. 3, pt. 6 (1904) 92.

Maxillaria purpurea (*Spreng.*) *Ames & Correll* var. **parviflora** (*Poepp. & Endl.*) *C. Schweinfurth var. nov.*

Scaphyglottis parviflora Poeppig & Endlicher Nov. Gen. ac Sp. 1 (1836) 58, t. 97.

Ornithidium vestitum Reichenbach filius in Walpers Ann. 6 (1863) 491, *partim*—Cogniaux in Martius Fl. Bras. 3, pt. 6 (1904) 95, *partim.*

Several authors, including Reichenbach filius and Cogniaux, have referred *Scaphyglottis parviflora* Poepp. & Endl. to the synonymy of *Ornithidium vestitum* or *Maxillaria purpurea* as the latter concept becomes when treated as a Maxillaria (cf. Ames & Correll in Bot. Mus. Leafl. Harvard Univ. 11 (1943) 16).

However, I feel reluctant to follow their example for

the following reasons. *Scaphyglottis parviflora* is described and illustrated as usually having bifoliate pseudobulbs and a lip which terminates in an oblong apical lobe that appears to be distinctly smaller than the lateral lobes. On the other hand, *Ornithidium vestitum*, which was described by Swartz as *Epidendrum vestitum*, is noted by Fawcett & Rendle (Fl. Jam. 1 (1910) 122, 123) as having unifoliate pseudobulbs and a mid-lobe of the lip which is ovate and distinctly larger than the lateral lobes—a diagnosis made presumably after examining Swartz' type. Moreover, all of the other material referred to *Ornithidium vestitum* (from Central America and Peru) shows the same unifoliate pseudobulbs and a relatively large ovate mid-lobe of the lip.

It seems to be preferable, therefore, to follow Fawcett & Rendle's interpretation of *Ornithidium vestitum* and to consider this species as always having unifoliate pseudobulbs and a relatively large ovate mid-lobe of the lip. Following this interpretation, I am regarding *Scaphyglottis parviflora* as a variety of *Ornithidium vestitum*, and have made the proper varietal combination under Maxillaria.

Maxillaria ramosissima *Kränzlin* in Engler Bot. Jahrb. 54, Beibl. 117 (1916) 29.

Two isotypes of this species (*Weberbauer 6273*) in the Gray Herbarium and in the Herbarium of the Field Museum show certain disparities from the description.

The pseudobulbs are ellipsoid to pyriform-cylindric, rather than ovate, and up to 3 (not 2.5) cm. long. The leaves are up to 9 (not 8) cm. long. The pedunceles bear sometimes as many as 15 (not 8–9) sheaths. The sepals are oblong-lanceolate and compliCate-acute (not narrowly ovate-triangular and long-acuminate) and they are about 1.6 (not 2) cm. long. The petals are elliptic-linear (not

lanceolate) and complicate-acute (not acuminate). The lip is oblong-obovate (not oblong), broadly rounded and lightly retuse (not obtuse), and the sides of the lower portion are erect and auriculiform; the disc lacks the three elevated lines which are described.

Maxillaria rufescens *Lindley* in Bot. Reg. 21 (1835) sub t. 1802; 22 (1836) t. 1848—Reichenbach fil-ius in Saunders Refug. Bot. 2 (1870) t. 79 (var. *flavida*); 2 (1882) t. 133—Cogniaux in Martius Fl. Bras. 3, pt. 6 (1904) 12.

Maxillaria Abelei Schlechter in Fedde Repert. Beih. 9 (1921) 101; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 125, nr. 488.

After careful consideration, it appears certain that *Maxillaria Abelei* should be included in the extremely variable and widespread species, *M. rufescens*. There are no morphological differences to distinguish the former concept, the only apparent discrepancies being in size. *M. Abelei* is a larger plant than the average specimen of *M. rufescens*, the leaf being often somewhat larger (especially broader) and the floral segments a little longer than any attributed to or observed in the latter species. Therefore, considering that the sepals of various forms of *M. rufescens* range from 0.8 to 2 cm. in length, it seems scarcely advisable to recognize as distinct the concept *M. Abelei* in which the sepals are designated as about 2.4 cm. in length.

In a recently examined Peruvian collection of *M. rufescens* (*G. Klug 10118*), the larger leaf is about 28.5 cm. long and 4.8 cm. wide (as compared with a maximum of 23 cm. long and 4.5 cm. wide in *M. Abelei*); the lateral sepals are about 2.4 cm. long (as in *M. Abelei*) and 9.5 mm. wide; the petals are about 2.3 cm. long (longer than in *M. Abelei*); the lip, which is slightly larger than

that credited to *M. Abelei*, is about 2.1 cm. long and 1.2 cm. wide across the expanded lateral lobes; and finally the column is about 1.6 cm. long (contrasted with 1.1 cm. long in *M. Abelei*).

Although the pseudobulbs of *M. rufescens* are almost always crowded or approximate, I have seen one Peruvian collection (Dept. of Loreto, *G. Klug 10020*) which has the pseudobulbs 2 to 3 cm. distant.

Including its various forms, *Maxillaria rufescens* occurs from British Honduras and Guatemala to Costa Rica, in the West Indies and in South America south to Brazil and Peru (Prov. Loreto).

Maxillaria Tafallae (*Reichb.f.*) *C. Schweinfurth comb. nov.*

Scaphyglottis Tafallae Reichenbach filius in Linnaea 22 (1849) 855.

Ornithidium Tafallae Reichenbach filius in Bonpl. 2 (1854) 18.

Ornithidium dichotomum Schlechter in Fedde Repert. Beih. 7 (1920) 178; ex Mansfeld in Fedde Repert. Beih. 57 (1929) t. 63, nr. 245.

Two recently examined collections from the Department of San Martín in Peru are undoubtedly referable to *Ornithidium Tafallae* (described as *Scaphyglottis Tafallae*) which is represented in the Ames Herbarium by a series of drawings with a floral analysis from the Reichenbach Herbarium in Vienna. Apparently the only difference is that Reichenbach's drawing shows a sharply three-lobed anterior portion of the lip (described as obtusely three-lobed), whereas the Peruvian specimens have at most an obscurely 3-lobulate apical portion. The Peruvian collections show that the species is a large sprawling plant with unifoliate pseudobulbs at intervals of 1 to 19 cm. surrounded on each side by one or two pairs of leaf-

bearing sheaths and with widely spreading branches in the axil of the sheaths below the pseudobulb. The leaf-blades vary from about 4 to 21 cm. in length and they are often as much as 4 cm. in width.

The Colombian *Ornithidium dichotomum* is surely synonymous with this species, although it has somewhat smaller leaves than the usual form of *O. Tafallae* and the terminal portion of the lip is only obscurely indented on each side or subtrilobed, as in the Peruvian specimens. The flowers of this form are noted as rosy white, whereas those of the Peruvian specimens are described as "cream" or "cream-green."

San Martín: Zepelacio, near Moyobamba, at 1200-1600 meters altitude, epiphyte in forest, January 1934, *G. Klug 3544;* same locality, at about 1100 meters altitude, June 1934, *Klug 3694.*

Maxillaria tenuis *C. Schweinfurth sp. nov.*

Herba epiphytica, tenuis. Pseudobulbi aggregati, in sicco cylindracei, complanati, unifoliati. Folium petiolatum; lamina linearis, acuta, basi cuneata, coriacea. Scapi basales, perbreves, uniflori, pedunculo vaginis nonnullis tubulatis omnino tecto. Flos pro planta grandis. Sepalum dorsale lineari-lanceolatum, complicato-acutum, basi concavum. Sepala lateralia lanceolato-linearia, leviter obliqua, acuta, mentum breve formantia. Petala oblique lineari-triangularia, acuminata. Labellum perbreve, lateribus inferioribus erectis, supra medium profunde trilobatum; lobi laterales perangusti, in apicem liberum ovato-rotundatum terminantes; lobus medius triangulari-ovatus, acuminatus, multo incrassatus. Columna parva, in pedem brevem extensa.

Plant small, slender, epiphytic. Roots fibrous, filiform, glabrous, whitish, numerous. Rhizome apparently abbreviated. Pseudobulbs aggregated, cylindric, finely rugose-striate and often oblique in the dried specimen,

complanate, unifoliate, about 2.3 cm. or less long, surrounded and surpassed by relatively large distichous pustulose triangular sheaths which waste into fibres. Leaf petioled; lamina linear, sharply acute, cuneate below, coriaceous, with the mid-nerve suleate above and prominently carinate beneath, about 14 cm. or less long, up to 8 mm. wide; petiole short, slender, deeply channelled, about 1.5 cm. or less long. Scapes lateral, basal, very short, 1-flowered; peduncle entirely concealed by a few loose tubular imbricating sheaths, about 3.2 cm. high; pedicellate ovary about 1.2 cm. long. Flower white and yellow, large for the plant. Dorsal sepal linear-lanceolate, compliate-acute, apiculate, dorsally lightly carinate near the apex, concave near the base, about 2.7 cm. long, almost 4 mm. wide below. Lateral sepals lanceolate-linear, lightly oblique, acute, apiculate, forming with the short column-foot an inconspicuous mentum, about 2.7 cm. long, 3–4 mm. wide at the base. Petals obliquely linear-triangular, acuminate, about 2.45 cm. long and 2.8 mm. wide near the base. Lip relatively very short, erect, parallel to the column, lightly recurved and about 9.5 mm. long, with upcurved sides in natural position, sessile, sharply 3-lobed about two thirds the distance from the base, elliptic-ovate in outline when expanded; lateral lobes erect, narrow, terminating in a short ovate-rounded free portion; mid-lobe triangular-ovate, short-acuminate, very fleshy and minute-papillose, about 4 mm. long; disc through the center of the lower half with a longitudinal thickening which becomes a conspicuous fleshy oblong suleate callus above. Column very small, lightly arcuate, about 5.5 mm. long at the back, produced into a short foot.

Florally this species is very close to *Maxillaria ochroleuca* Lodd. ex Lindl., but vegetatively it is very much smaller with acute leaves. It is apparently similar to *M.*

taracuana Schltr. vegetatively, but has much longer sepals and a dissimilar lip. The small size of the plant and the linear sharp-pointed leaves of *Maxillaria tenuis* are unusual.

Loreto: Mishuyacu, near Iquitos, at 100 meters altitude, epiphyte in forest, February-March 1930, *G. Klug 1045* (TYPE in U.S. Nat. Herb. No. 1456126).

Maxillaria vandiformis (*Schltr.*) *C. Schweinfurth comb. nov.*

Camaridium vandiforme Schlechter in Beih. Bot. Centralbl. 42, Abt. 2 (1925) 137.

Although the type of *Camaridium vandiforme* came from Brazil (Amazonas), several collections from eastern Peru are referable to this concept. In these specimens the leaves show greater range in size than that given for the type, the length being commonly shorter than the cited minimum of 12 cm. and only rarely reaching the stated maximum of 18 cm.; also they are sometimes 8 mm. in width (as contrasted with 5–6.5 mm., as cited). The flowers appear to be slightly larger than those described, the lateral sepals being 1.5–1.7 (instead of 1.4) cm. long. Moreover, all of the sepals are acute or short-acuminate (not subobtuse). Finally, the lip is complicate-acute (rather than truncate and obtuse with an apicule) and the pedicellate ovary attains 2.8 cm. in anthesis.

It is possible that the Colombian *Camaridium equitans* Schltr., which is an earlier concept, may prove to represent the same species, but the description of its leaves and especially the illustration of its lip (Schltr. ex Mansf. in Fedde Repert. Beih. 57 (1929) t. 63, nr. 242) show differences.

Amazonas: near Napo, at about 100 meters altitude, August 2, 1924, *G. Tessmann 3737*.—Loreto: lower Río Huallaga, Santa Rosa, at 155–210 meters altitude, on tree trunk, November 11, 1929, *Llewelyn Williams 4908* (sterile specimen); vicinity of Iquitos, at 100 me-

ters altitude, epiphyte in dense forest, January–February 1937, *G. Klug 10076*.—San Martín: Chazuta, Río Huallaga, at about 260 meters altitude, in forest, flowers cream-color and dark violet, April 1935, *G. Klug 4101*.

Maxillaria verrucifera *C. Schweinfurth sp. nov.*

Herba epiphytica, robusta, magna. Pseudobulbus ovoideus vel cylindraceo-pyriformis, unifoliatus. Folium magnum, petiolatum; lamina oblonga vel elliptico-oblonga, plusminusve acuta, basi cuneata; petiolus elongatus, conduplicatus. Inflorescentia perbrevis, pedunculo cum ovario vaginis distichis ovatis imbricatis omnino tecto. Flos pro planta parvus. Sepala basi concava, lateribus revolutis. Sepalum dorsale oblongo-ovatum, abrupte complicato-acutum. Sepala lateralia similia, obliqua. Petala obovato-oblonga, subacuta, quam sepala paulo breviora. Labellum super medium trilobatum, expansum in circuitu late ellipticum; lobi laterales angusti, apice libero rotundato; lobus medius suborbicularis, incrassatus, verrucosus, supra recurvus; discus parte inferiore incrassatione lineari ornatus. Columna erecta, antice sulcata, cum pede perbrevi.

Plant large, robust, epiphytic. Roots fibrous, glabrous, elongate. Pseudobulb apparently ovoid or cylindric-pyriform (imperfect in the specimen), plurisulcate when dry, unifoliate, about 5 cm. long, apparently rather compressed, surrounded by the fibres of sheaths. Leaf large, petioled; lamina oblong or elliptic-oblong, acute or subacute, about 50.8 cm. long and 5.8 cm. wide, cuneate below, coriaceous, shining above and dull beneath, with the mid-nerve sulcate above and strongly carinate beneath; petiole elongate, stout, conduplicate or deeply channelled, about 17.3 cm. long. Inflorescence (separated in my specimen) very short, 1-flowered; peduncle with pedicellate ovary about 2.9 cm. long, entirely concealed by six broadly ovate distichous imbricating sheaths.

Flower rather small for the plant, "brown-yellow and wine-red," with the lip apparently maculate. Sepals with revolute margins, concave at the base. Dorsal sepal oblong-ovate, abruptly complicate-acute, about 2.2 cm. long and 9 mm. wide when expanded. Lateral sepals similar, obliquely ovate-oblong, abruptly complicate-acute, about 2.3 cm. long and 10 mm. wide, adnate to the abbreviated column-foot forming a very short mentum. Petals concave, obovate-oblong, lightly oblique, subacute, about 2 cm. long and 10 mm. wide above the middle. Lip large, erect, parallel to the column and recurved in natural position, sharply 3-lobed above the middle, broadly-elliptic in outline when expanded, about 1.9 cm. long and 1.2 cm. wide across the middle; lateral lobes erect, narrow with an abbreviated rounded crenulate free apex; mid-lobe suborbicular from a very short claw, abruptly recurved above, undulate and finely crenulate-erose on the margins, fleshy and densely verrucose except near the margins, the warts being especially conspicuous, dense and enlarged above the middle; disc through the lower part with a median linear-oblong thickening which terminates in a prominent rounded callus. Column rather straight, sulcate in front, about 1.1 cm. high at the back, with a very short foot.

This species seems to be allied to *Maxillaria Huebneri* Schltr., but differs in having a markedly larger pseudobulb, a much larger leaf and petiole and a somewhat dissimilar lip.

The specific name is in allusion to the verrucose mid-lobe of the lip.

Loreto: vicinity of Iquitos, at 100 meters altitude, on living tree in dense forest, December 1936, *G. Klug 10047* (Type in Herb. Ames No. 61910).

Maxillaria xantholeuca *Schltr.* var. **peruviana** *C. Schweinfurth var. nov.*

Recently I have examined two collections of a Peruvian orchid which appear to be florally inseparable from the Ecuadorian *Maxillaria xantholeuca* described in Fedde Repert. Beih. 8 (1921) 98, with a floral analysis in Fedde Repert. Beih. 57 (1929) t. 97, nr. 381. Except for a difference in the color of the flowers, the discrepancies are entirely vegetative. Although these two collections show a rather wide divergence from one another in the vegetative parts, both of them have the rhizome adorned with shallow spreading infundibuliform sheaths, whereas that of the typical plant is described merely as "vaginis pluribus obtecto."

One of these Peruvian collections (*Weberbauer 7912*) has a loosely branching rhizome and pseudobulbs 3 to 7 cm. distant (the typical form has them about 3 cm. apart). Its leaves range from elliptic-oblong to oblong and when mature are 4.5–8.2 cm. long and 0.9–1.5 cm. wide (those of the type cited as oblong, 3.5–4 cm. long and 1.3–1.5 cm. wide). The inflorescences also are somewhat longer than specified.

In the other collection (*Killip & Smith 23155*), the rhizome is unbranched and bears the pseudobulbs at intervals ranging from about 0.5 to 4 cm. The leaves of this collection are elliptic to oblong-elliptic and vary from 6.7 to 10.3 cm. long and from 1.5 to 2.1 cm. wide.

Cuzco: Prov. of Calca, Lares Valley above Mantoc, at 2600–2700 meters altitude, on rocks, "sepals reddish brown with greenish points," March 8, 1929, *A. Weberbauer 7912* (Type in Herb. Field Mus. No. 605243; isotype in Herb. Ames No. 61951).—Ayacucho: Aina, between Huanta and Río Apurimac, at 750–1000 meters altitude, epiphyte in open woods, "segments light green, lip darker, column paler," May 7, 17, 1929, *E. P. Killip & A. C. Smith 23155*.

Maxillaria xanthorhoda *Schlechter* in Notizbl. Bot. Gart. Mus. Berl. 7 (1918) 279; ex Mansfeld in Fedde Repert. Beih. 58 (1930) t. 52, nr. 205.

Judging from a photographic record in the Ames Herbarium of the type of this species, the leaves appear to be oblong-elliptic, not ligulate as described; they measure scarcely more than 3 cm. in length and 1 cm. in width, whereas they are described as 3–4.5 cm. long and almost 8–11 mm. wide.

Of further interest is an imperfect flower in a packet labelled "Maxillaria xanthorhoda, Hort. Dahlem" in the handwriting of Dr. R. Mansfeld. This shows a lateral sepal which is neither obovate nor oblong-obovate (as described and illustrated), but lanceolate-oblong as in *M. variabilis* Batem. The other sepals and the lip are too fragmentary to afford any evidence. Perchance this flower was mistakenly derived from a specimen of *M. variabilis*, for it was stated on the packet to have been collected in April 1933, whereas the type of *M. xanthorhoda* was said to bloom in April 1918.

Maxillaria xylobiiflora *Schlechter* in Fedde Repert. 27 (1929) 76.

Several Peruvian collections prove to be referable to the Bolivian *M. xylobiiflora*. There appear, however, to be certain discrepancies which should be enumerated.

The pseudobulbs are apparently ellipsoid-cylindric with an abrupt linear complanate beak (in the dried specimen), rather than linear and slightly narrowed above as described. The inflorescences are mostly shorter than the leaves, not almost equaling them as cited. The median callus on the disc of the lip extends to well above the middle, rather than almost to the middle as stated, and has a simple, acute, not a 4-denticulate apex.

Ayacucho: Aina, between Huanta and Río Apurimac, at 750-1000 meters altitude, epiphyte in open woods, floral segments pinkish white to brownish (mature and withered), *E. P. Killip & A. C. Smith 22596, 22611, 23163.*

EXPLANATION OF THE ILLUSTRATIONS

PLATE XIV. MAXILLARIA CORNUTA *C. Schweinf.*
1, plant, natural size. 2, flower without lip, expanded, twice natural size. 3, lip from above, natural position, twice natural size. 4, lip and column from side, natural position, three times natural size.

PLATE XV. MAXILLARIA CUZCOENSIS *C. Schweinf.*
1, plant, one half natural size. 2, flower without lip, expanded, one and one half times natural size. 3, lip from side, natural position, one and one half times natural size. 4, lip from above, natural position, twice natural size.

PLATE XVI. MAXILLARIA FUNICAULIS *C. Schweinf.*
1, plant, one half natural size. 2, flower from side, natural position, two and one half times natural size. 3, dorsal sepal, expanded, twice natural size. 4, petal, twice natural size. 5, lateral sepal, twice natural size. 6, column and lip from side, natural position, two and one half times natural size. 7, lip from above, partially expanded, four times natural size.

PLATE XVII. MAXILLARIA PARVIBULBOSA *C. Schweinf.*
1, plant, natural size. 2, flower without lip, expanded, natural size. 3, lip from above, expanded, three times natural size.

PLATE XVIII. MAXILLARIA TENUIS *C. Schweinf.*
1, plant, natural size. 2, flower, expanded, twice natural size. 3, lip from above, expanded, four times natural size.

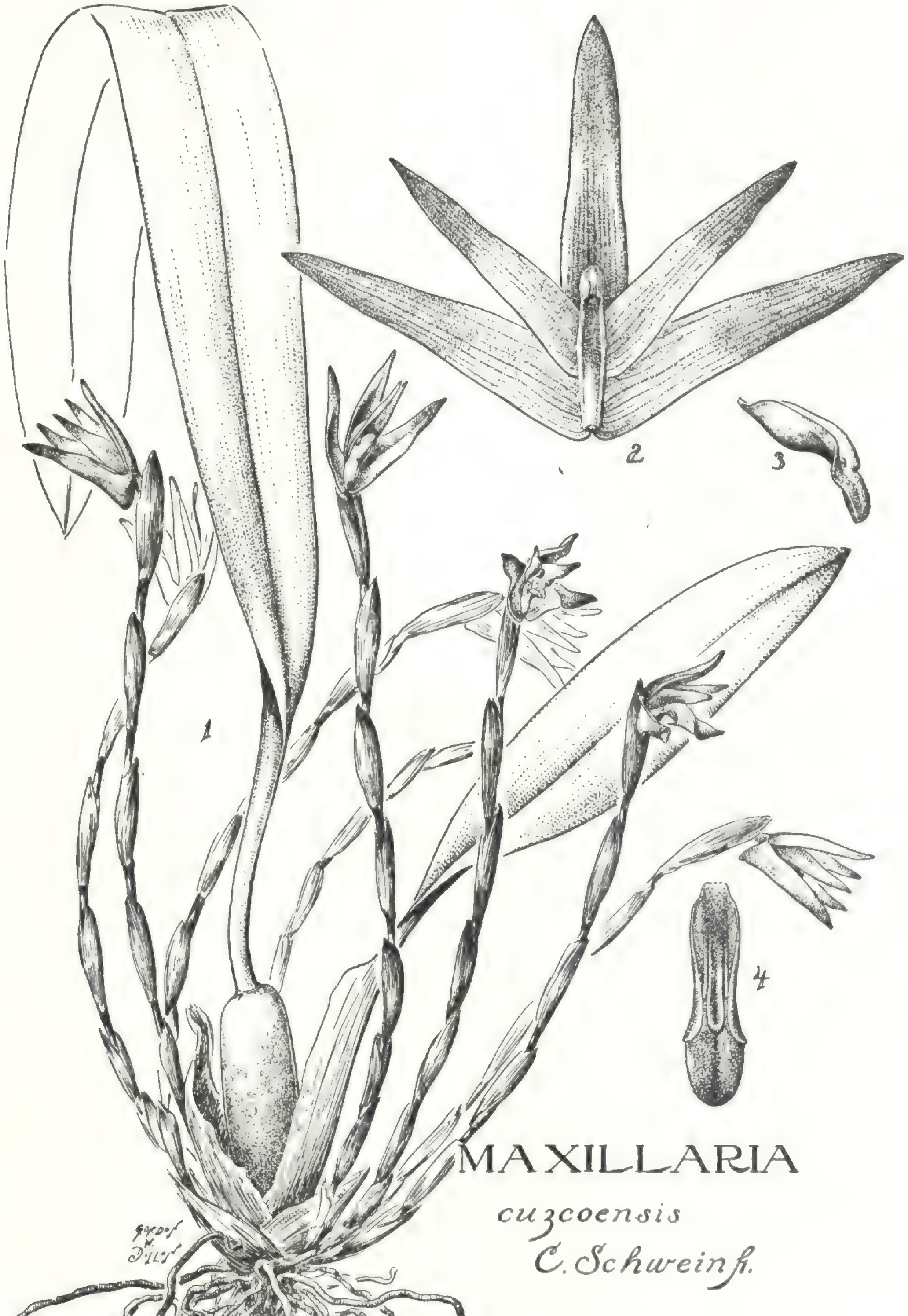
PLATE XIX. MAXILLARIA VERRUCIFERA *C. Schweinf.*
1, plant, one half natural size. 2, flower on peduncle from side, natural position, natural size. 3, dorsal sepal, partially expanded, twice natural size. 4, petal, twice natural size. 5, lateral sepal, partially expanded, twice natural size. 6, lip from above, expanded, twice natural size. 7, column and lip from side, natural position, twice natural size.

PLATE XIV

MAXILLARIA

cornuta *C. Schweinf.*

Plate XV



MAXILLARIA

cuzcoensis

C. Schweinfk.

Plate XVI

MAXILLARIA

Funicaulis

C. Schweinf.

Plate XVII

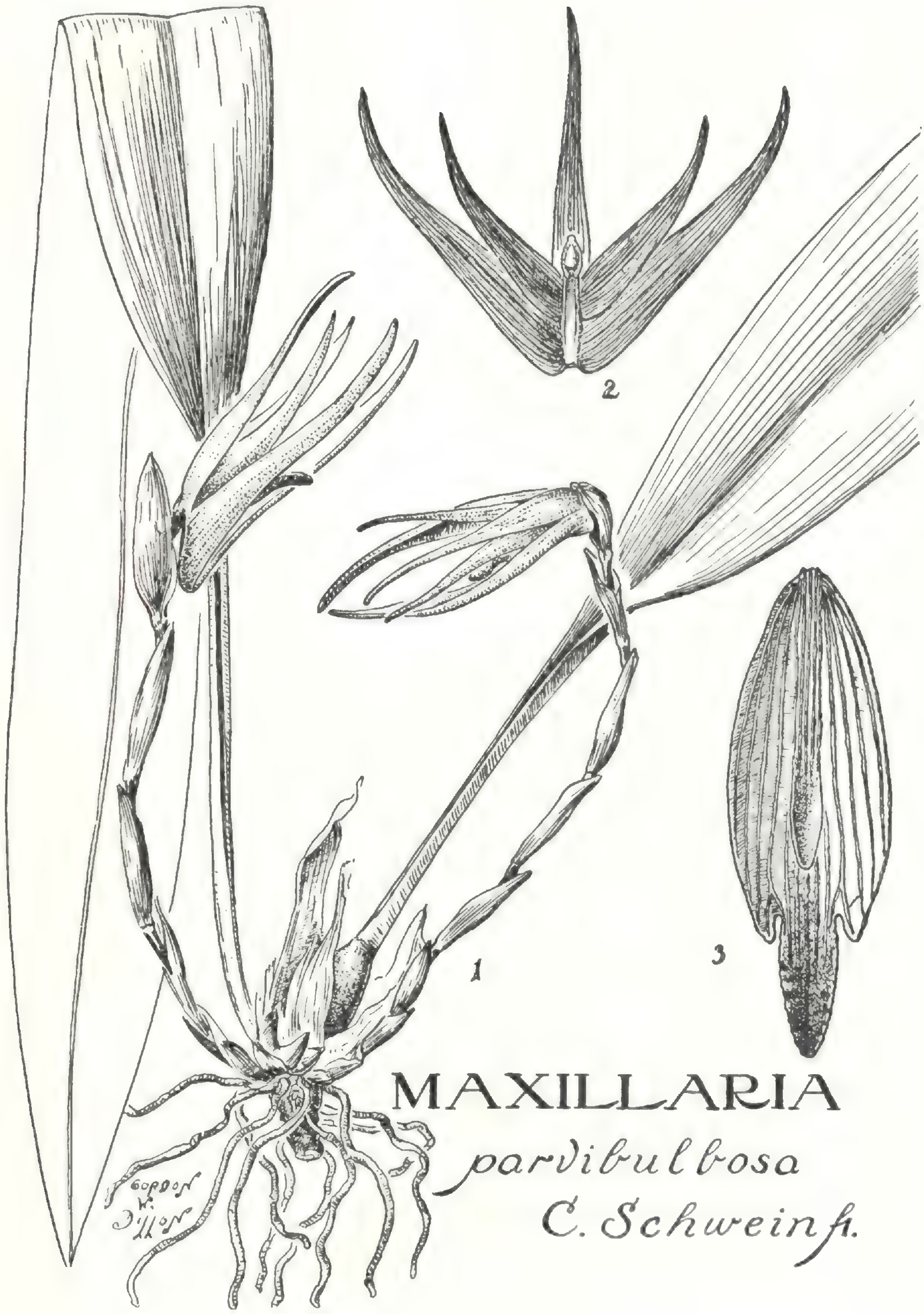


Plate XVIII

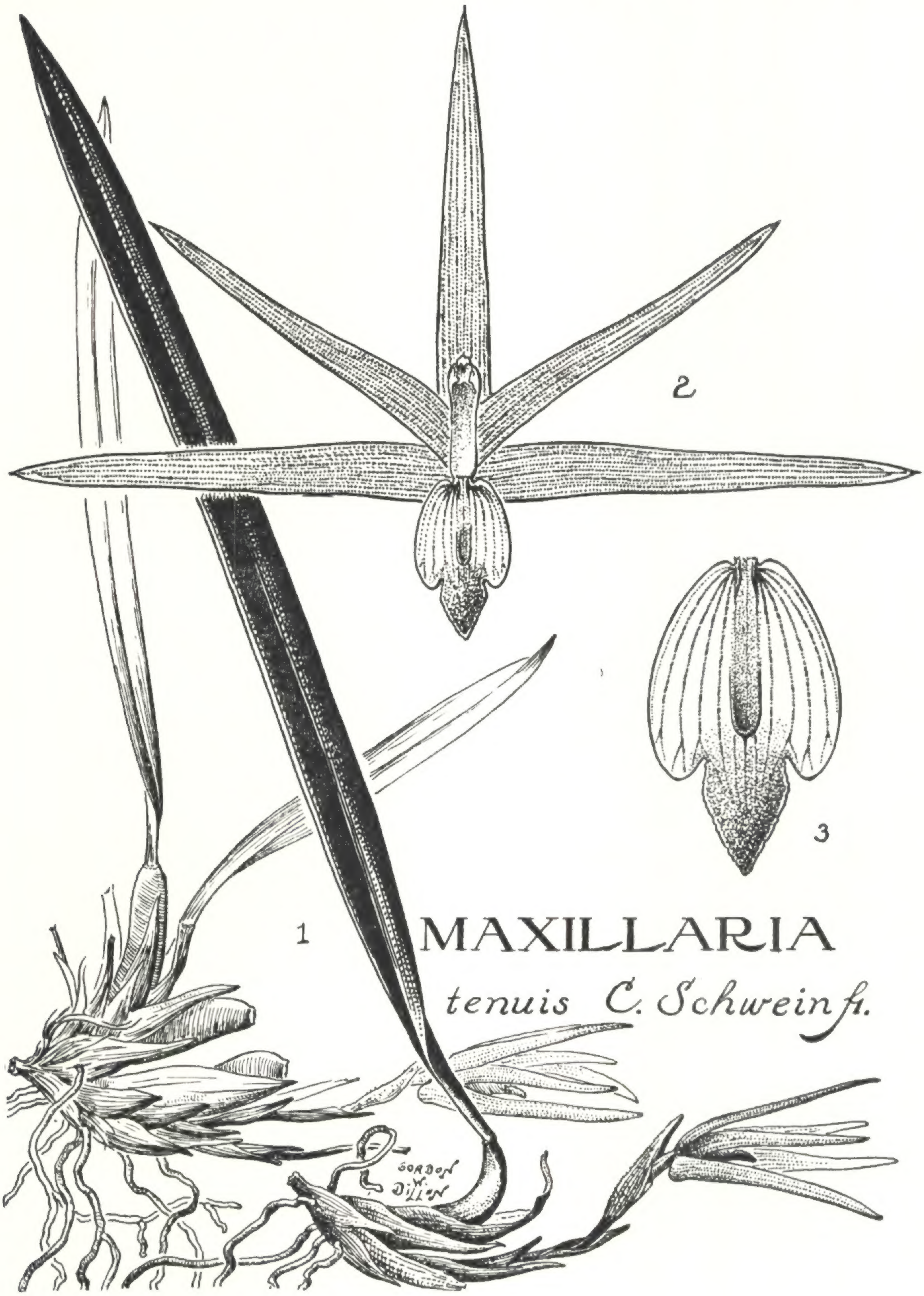
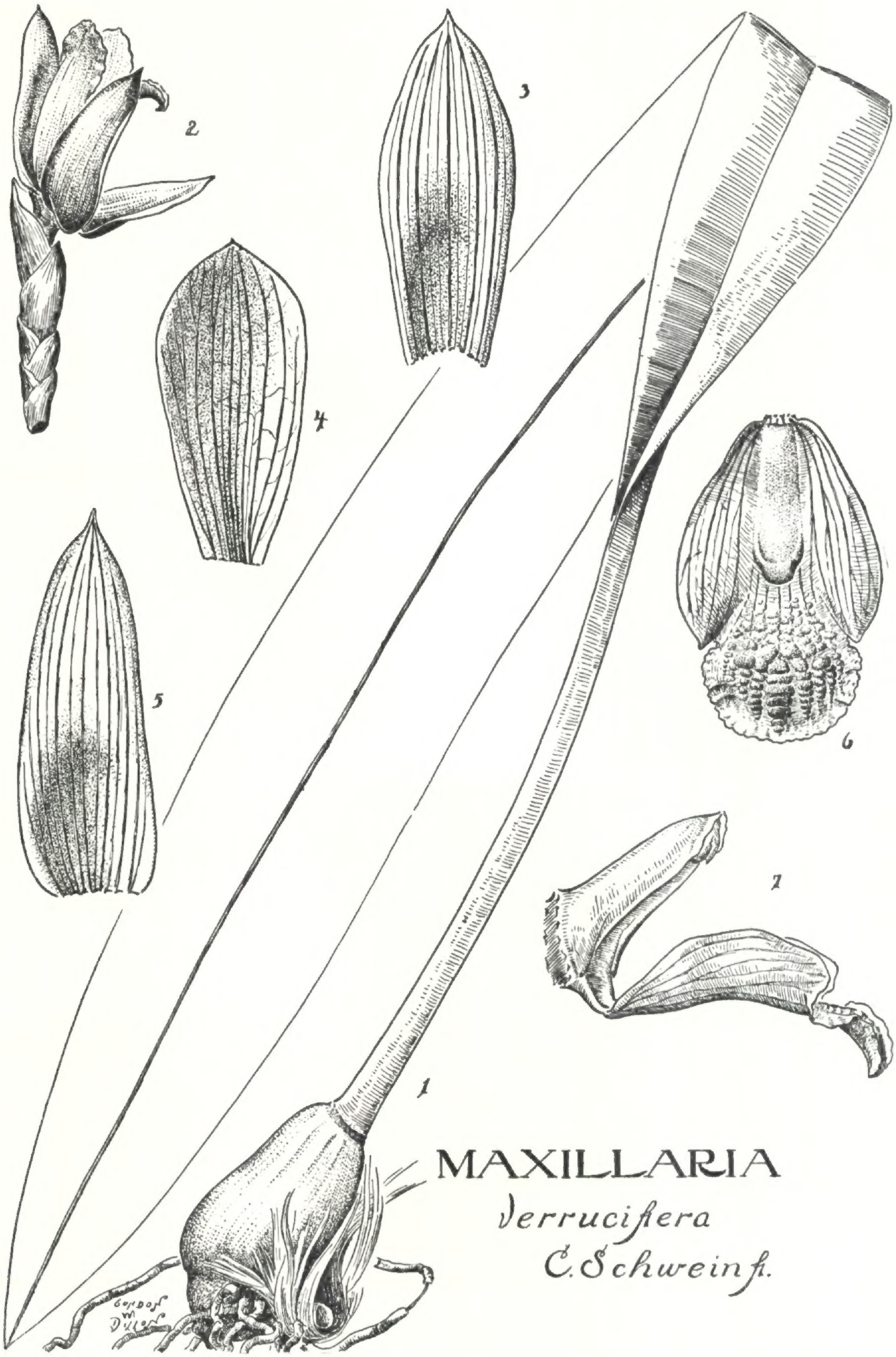


Plate XIX



MAXILLARIA

Verrucifera

C. Schweinfl.